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## Preface

This volume contains papers presented at the 2006 *Formal Description of Slavic Languages* (FDSL 6.5) conference, which was held at the *University of Nova Gorica* in Nova Gorica, Slovenia. This was the first time FDSL was held away from the otherwise alternating host cities of Leipzig and Potsdam, and in a “Slavic speaking” country, and we are very happy to have had the opportunity to do that. It was also the first time the otherwise biennial FDSL was held just one year after the previous conference, hence the name FDSL 6.5, to suggest its ‘stopover’ status in the regular shift from FDSL 6 in Potsdam (2005) to FDSL 7 in Leipzig (2007). We would like to thank everybody who helped organize the conference. In our view, it was a successful conference, and we sincerely hope that it will help turn FDSL into a regular annual event.

We received 59 abstracts for consideration and ended up having 28 regular talks and 3 invited lectures.

Each abstract was read by at least 3 reviewers. The following is a list of the people who served as abstract reviewers: *Boban Arsenijević, John Bailyn, Christina Bethin, Loren Billings, Željko Bošković, Barbara Citko, Boštjan Dvořak, Alja Ferme, Steven Franks, Marija Golden, Gašper Ilc, Iliyana Krapova, Jonathan MacDonald, Franc Marušič, Tatjana Marvin, Roland Meyer, Krzysztof Migdalski, Tanja Milićev, Nataša Milićević, Andrew Nevins, Barbara Partee, Ljiljana Progovac, María Luisa Rivero, Dominik Rus, Amanda Saksida, Tobias Scheer, Danijela Stojanović, Andrej Stopar, Adam Szczegielniak, Olga Mišeska Tomić, Draga Zec, Rok Žaucer, and Sašo Živanović*. We are grateful to everyone for their help.

Out of the 31 presented papers, we received 20 written versions, 19 of which are now appearing in this volume (1 was subsequently withdrawn).

Every paper was read by an external reviewer and by one of us, so that each paper got two sets of comments they were asked to incorporate. The following people served as external reviewers: *Artemis Alexiadou, Christina Bethin, Loren Billings, Sylvia Blaho, Wayles Browne, Barbara Citko, Marcel den Dikken, Hana Filip, Gerhard Jaeger, Dalina Kallulli, Tatjana Marvin, Ora Matushansky, Andrew Nevins, Barbara Partee, Vladimir Petkevič, Ljiljana Progovac, Gilbert Rappaport, Božena Rozwadowska, Tobias Scheer, and Eytan Zweig*. We are grateful to everyone for their help.

The conference would not have been possible without the generous financial support from the following organizations:

- ARRS (Slovenian Research Agency)
- En d.o.o.
- Šolski center Nova Gorica



– Zavarovalnica Maribor d.d.

We also wish to thank the University of Nova Gorica, and all the participants of the conference.

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## On two types of negative constituents and negative concord\*

Progovac's (1994) seminal work discusses two types of negative constituents (NCIs) in Serbo-Croatian (SC), *ni*- and *i*-NCIs. (1) shows that *ni*-NCIs require clause-mate negation, while *i*-NCIs do not tolerate it. *I*-NCIs co-occur with long-distance negation and can occur in some non-negative contexts, illustrated in (2), where *ni*-NCIs cannot occur. (Subjects and objects behave in the same way in all these respects. The translations are a bit misleading; they are given for ease of exposition.)

- (1) a. *Niko/\*iko nije zaspao.*  
 nobody/anyone neg+is fallen-asleep  
 "Nobody fell asleep."  
 b. \**Niko/\*iko je zaspao.*  
 c. *Milena nije rekla da je iko/\*niko zaspao.*  
 Milena neg+is said that is anyone/nobody fallen-asleep  
 "Milena did not say that anyone fell asleep."
- (2) a. *Da li je iko/\*niko zaspao?*  
 Q is anyone/nobody fallen-asleep  
 "Did anyone fall asleep?"  
 b. *Milena će biti otpuštena ako iko/\*niko ode kući.*  
 Milena will be fired if anyone/nobody goes home

Progovac proposes a binding account of these data, based on the concept of A'-binding.<sup>1</sup> She proposes *ni*-NCIs are anaphoric elements subject to Principle A: they have to be A'-bound by negation in their governing category. *I*-NCIs are anaphoric pronominals, subject to Principle B: they have to be A'-free in their governing category, but bound within the sentence. To see how the account works consider (3), where neg and Op are the relevant A'-licensors (Progovac assumes Op is the licensor in non-negative contexts). The binding domain in (3) is the embedded IP. Being anaphoric, the *ni*-item can only be bound by the embedded Neg. An *i*-item has to be free within its binding domain. It can then

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\* For insightful comments, I thank Ljiljana Progovac, Lanko Marušič, and the FDSL audience.

1 The following simplifies Progovac's analysis, which does not affect the points made below.

be licensed by a non-negative licenser or a higher clause negation, but not clause-mate negation.

(3) [IP Neg [VP [CP Op [IP Neg [VP *ni*-item/*i*-item]]]]]

The analysis captures the above facts in an elegant manner. However, it also faces some problems. I refer the reader to Beck (1998) for relevant discussion, merely pointing out that the extension of the analysis to other languages is crucially based on stipulations regarding which NCIs subject to Condition A are allowed to move in LF (to get close to its licenser) and how they do it, and leaves SC *i*-NCIs as exceptional in being the only NCIs subject to Condition B. Furthermore, a number of recent works have argued that Conditions A and B should be eliminated (e.g. Hornstein 2001 and Kayne 2005), a line of research which, if successful, would deprive Progovac's analysis of the mechanism it crucially needs.<sup>2</sup> These problems would not necessarily condemn the analysis, especially in the absence of a viable alternative. However, in section 2, I will present a reconstruction paradigm that raises a serious empirical problem for the binding account, and develop an alternative analysis that can handle the data in question. (The paradigm will be shown to raise an equally serious problem for Progovac's 2005 analysis, which does not appeal to binding conditions). Based on this, I will conclude the binding account (as well as Progovac's 2005 account) should be abandoned. Before presenting the paradigm in question, I will first outline the analysis to be argued for in this paper (the main component of the analysis was actually proposed in Uribe-Echevarria 1994, though it was not really worked out in that work).

## 1. Movement to SpecNegP

In this section, I will argue that rather than being subject to different binding conditions, *ni*- and *i*-items differ with respect to whether or not they move to NegP overtly. There are two ways to implement the analysis:

1. There is one lexical item for *ni*-/*i*-series counterparts. They differ in that *ni*-items undergo overt movement to SpecNegP, while *i*-items either undergo covert movement or do not move to SpecNegP (for *ni*-movement, see also Abels 2005, Brown 2005, and Progovac 2005).
2. *Ni*/*i*-elements are different lexical items, *ni*-items move to NegP, while *i*-items cannot move to NegP.

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2 The mechanisms used to capture anaphor/pronoun binding effects in this line of research do not seem to be extendable to NCIs.

In both analyses, *ni*-items are licensed in a Spec-Head configuration with negation, as shown in (4a). Under option 1, we can actually adopt (4b), where *iko* is spelled out as *niko* as a reflex of Spec-Head agreement (SHA) with negation.<sup>3</sup>

- (4) a. [<sub>NegP</sub> *niko* [<sub>Neg'</sub> neg  
 b. [<sub>NegP</sub> *iko* [<sub>Neg'</sub> ne =*niko*

Consider first *ni*-items. Subject NCIs can be easily handled under the above analysis, with *niko* in (1a) either staying in SpecNegP or moving from there to a higher position. What about object NCIs? (5a) can be handled in the same way as (1a). (5b), where the object does not seem to be located in SpecNegP, is trickier.

- (5) a. *Nikoga ne voli.*  
 nobody-acc neg loves-3p  
 “He/she does not love anyone.”  
 b. ?*Ne voli nikoga.*

Note that (5a) is preferred to (5b). There are then two options: the contrast can be taken to be significant, confirming the above account (word order violations are typically rather weak in free word order languages like SC), or we can assume there is fronting of the NCI to NegP in both cases, with something happening to (5b) after the fronting that may be related to the rather extreme freedom of word order in SC. One option is remnant movement along the lines of Kayne (1998).

- (6) a. [<sub>NegP</sub> *nikoga*<sub>i</sub> [<sub>Neg'</sub> *ne voli* *t*<sub>i</sub>  
 b. [<sub>XP</sub> *nikoga*<sub>i</sub> [<sub>NegP</sub> *t*<sub>i</sub> [<sub>Neg'</sub> *ne voli* *t*<sub>i</sub> (object shift/focus movement/scrambling)  
 c. [<sub>NegP</sub> *t*<sub>i</sub> [<sub>Neg'</sub> *ne voli* *t*<sub>i</sub> ]<sub>j</sub> [<sub>XP</sub> *nikoga*<sub>i</sub> *t*<sub>j</sub>

*Nikoga* in (6) moves to SpecNegP, proceeding to a higher position, after which we get remnant movement of NegP. The second step of *nikoga* movement can involve object shift, focus movement, or scrambling (I will come back to this later). If *nikoga* must stay in SpecNegP (which is not easy to ensure given the

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3 We would not necessarily expect to find this type of morphological reflex of SHA in all languages, i.e., a lack of such morphological transparency would not necessarily prevent extension of the above analysis of the *ni/i* alternation to other languages. I simply follow the standard practice here: transparent morphology, as in SC, provides evidence for the SHA analysis; the lack of such morphology would not provide evidence against it—it would merely fail to provide an argument for it.

free word order of SC), we have several options. We can assume the head of NegP is null, with *ne* being lexically added to the verb. (5b) can then involve VP fronting even with *nikoga* located in SpecNegP (7a). If *nikoga* is in SpecNegP and *ne* in Neg<sup>0</sup>, we can assume (5b) involves Neg' movement, or if we adopt a multiple Spec analysis where NegP has two Specs, *nikoga* and a null Op (whose presence can be motivated by inner island effects, which involve an intervening A'-Spec), (5b) can involve NegP movement with the lower SpecNegP filled by the Op.

- (7) a. [<sub>NegP</sub> *nikoga*<sub>i</sub> null neg [<sub>VP</sub> *nevoli* t<sub>i</sub>  
 b. [<sub>NegP</sub> *nikoga*<sub>i</sub> ([<sub>NegP</sub> Op) *ne* [<sub>VP</sub> *voli* t<sub>i</sub>

There are two alternatives to the remnant movement account. Browne (2005) proposes that (5b) involves movement to SpecNegP followed by rightward movement of *nikoga*. Another possibility is that NegP may have a rightward Spec, in which case *nikoga* in (5b) can be located in SpecNegP.<sup>4</sup> One way or another, (5b) is handable.<sup>5</sup> If it is considered acceptable, under the current analysis it is crucial that the NCI in (5b) is not located in situ. There is also independent evidence for this. Consider (8).

- (8) a. ?*Ivan ne smatra nikoga budalom.*  
 Ivan neg considers nobody fool  
 "Ivan does not consider anyone a fool."  
 b. *Ivan nikoga ne smatra budalom.*

(8b) is preferred to (8a). To make things more interesting, suppose that we do not consider the contrast to be significant and treat both (8a) and (8b) as acceptable, (8a) being derived in one of the ways sketched above, e.g. remnant

4 See also Progovac (2005:171), who suggests that (5b) involves lower copy pronunciation of *nikoga*, which moves overtly to SpecNegP.

5 As far as I can tell, with appropriate adjustments all the options suggested above can handle examples like (ia), which would have multiple SpecNegP at some point of the derivation. (As usual, (ib) is preferred to (ia).)

(i) a. ?*Nikome ne daje ništa.*  
 nobody-dat neg gives nothing-acc  
 "He is not giving anything to anyone."  
 b. *Nikome ništa ne daje./Ništa nikome ne daje.*

Note also that if under the remnant fronting account, all *ni*-items must take step (6b) (see sec. 4), we can handle (ia) by assuming that *ništa* undergoes movement above XP (the NCIs in (ib) do not have to be adjacent), which is followed by remnant XP fronting (*nikome* would be located in SpecXP). Alternatively, *ništa* can stay in SpecXP, with XP fronting affecting only one SpecXP.

movement. Here is how the derivation would proceed. We first have predicate movement to a position below the final position of *nikoga* ((9a); Kayne (1998) gives independent evidence for such predicate movement). We then have *nikoga* fronting discussed above (9b), followed by remnant movement (9c).

- (9) a. *Budalom ne smatra nikoga.*  
       fool       neg consider nobody  
    b. *Nikoga budalom ne smatra.*  
    c. *Ne smatra nikoga budalom.*

Consider now (10). (10a) is clearly degraded. The contrast in (10) can now be easily captured if we assume the pronoun *nju* cannot undergo the movement from (9a). On the other hand, the contrast is surprising under the *ni*-in-situ analysis.

- (10) a. ??*Marija nije predala nikome nju.*  
       Marija neg+is given up nobody-dat her-acc  
       “Marija did not give her up to anyone.”  
    b. *Marija nikome nije predala nju.*

Consider also (11). In multiple *ni*-item examples, there is a clear contrast between fronted and in-situ examples, which is surprising under the in-situ analysis. The contrast was originally noted with respect to Russian by Browne (2005), who adopts the rightward-movement-from-SpecNegP analysis, and suggests that this rightward movement cannot apply multiply (sort of like English topicalization).

- (11) a. ?\**On nije dao ništa nikome nikad.*  
       he neg+is given nothing-acc nobody-dat never  
       “He did not ever give anything to anyone.”  
    b. *On ništa nikome nikad nije dao.*

What is important for us are the differences between fronted and non-fronted examples in (10) and (11), which are difficult to account for if *ni*-items are freely allowed to stay in situ. I will therefore proceed with the assumption that they are indeed not allowed to stay in situ, with (5b) handled in one of the ways explored above. Although the above derivations appear unnecessarily complicated, we will see below that the movement to SpecNegP analysis has strong independent support (see the reconstruction data in section 2 and the restructuring data in section 3 (regarding the latter, compare (24) with (25)/(36)). Before showing that, let me point out that the above analysis receives support

from the behavior of NCIs in other languages. Consider, e.g., negative concord items in West Flemish (WF). (SC *ni*-items are negative concord elements, see Watanabe 2004). Haegeman (1992) shows that fronted *n*-items like *niemand* in (12a) are located in SpecNegP (the account is updated with multiple Specs). (12a-d) then clearly show that negative concord requires movement to SpecNegP in WF. My suggestion is that the same holds for SC, though the extreme freedom of word order in SC sometimes masks the parallelism with WF. (Note the fact that SC *ni*-items always participate in negative concord follows given that they must move to SpecNegP.)

- (12)a. *da Valère niemand nie kent.* (negative concord)  
 that Valère nobody not knows  
 “that Valère does not know anybody”
- b. *da Valère nie niemand kent.* (double negation)  
 “that Valère does not know nobody”
- c. *da Valère an niemand niets nie gezeid eet.* (negative concord)  
 that Valère to nobody nothing not said has  
 “that Valère did not say anything to anyone”
- d. *da Valère an niemand nie niets gezeid eet.* (double negation)  
 “that Valère did not say nothing to anyone” (Haegeman & Zanuttini 1991)

Also relevant is Norwegian (13). Kayne (1998) argues *noen* is spelled out as *ingen* if it moves to SpecNegP, undergoing SHA with *ikke* (i.e. we are dealing here with a morphological reflex of SHA, *ingen* being a combination of *ikke+noen*). Since, as is well-known, participles in aux+participle structures in Norwegian stay in situ, the object in (13a-b) could not have moved to SpecNegP. As a result, *ingen* is disallowed. The derivation in question cannot be blocked in (13c), a V-2 case where the verb moves to C. Hence, we get *ingen*. Interestingly, in colloquial speech, the object can be fronted even in aux+participle structures, as in (13d). As expected, *ingen* is allowed in (13d), which contrasts in this respect with (13a-b).

- (13)a. *Jon har ikke lest noen romaner/\*ingen romaner.*  
 Jon has not read any novels
- b. *\*Jon har lest ingen romaner.*
- c. *Jon leser ingen romaner.*  
 Jon reads no novels
- d. *Jon har ingen romaner lest.*

To sum up, the current account on which *ni*-items must move overtly to Spec NegP, while *i*-items either do not do it or do it covertly, does not need to appeal

to Conditions A and B, hence is in line with recent attempts to eliminate them. The account also explains why *ni*-items cannot occur in non-negative contexts. It may also explain why only *ni*-items can be used in elliptical answers like (14).

- (14)a. *Šta si kupio?*            *Ništa/\*Išta.*  
 “What did you buy? Nothing.”  
 b. *Ništa<sub>i</sub> [<sub>NegP</sub> t<sub>i</sub> ~~nisam~~ — *kupio* t<sub>i</sub>]*  
 nothing        neg+am buy

Suppose (14a) is derived as in (14b), where the NCI moves above NegP, its movement through SpecNegP being forced by locality (see section 2, where it is argued that an element undergoing movement must pass through every projection on its way), which is followed by NegP ellipsis. Since the NCI passes through SpecNegP, only a *ni*-item is possible here. (I return to the details of ellipsis later; see also Watanabe 2004 and Ilc & Milojević Sheppard in press, who note that we get genitive of negation with ellipsis in Slovene, which argues for NegP deletion.)

## 2. Reconstruction effects

I now turn to what I believe is a rather strong argument for the current analysis, which is based on reconstruction effects. Consider (15).

- (15)a. *Nikoga nije poljubio.*  
 nobody-acc neg+is kissed  
 “He did not kiss anyone.”  
 b. *Nikoga Marko nije poljubio.*  
 nobody-acc Marko-nom neg+is kissed  
 c. *\*Ikoga (Marko) nije poljubio.*

*Nikoga* in (15) is fronted above negation, to a position which can be higher than SpecNegP, given (15b). Interestingly, *i*-items are not allowed in such examples (15c). (15) raises a problem for the binding analysis. We could try to handle it by assuming NCI reconstruction. This, however, will not work. Consider (16)-(17).

- (16) *Nikoga nisi tvrdio da je poljubio.*  
 nobody-acc neg+are claimed that is kissed  
 “You did not claim that he kissed anyone.”

- (17) *\*Ikoga nisi tvrdio da je poljubio.*

Suppose the reconstruction is obligatory. If *(n)ikoga* must reconstruct, we incorrectly predict (17) to be acceptable and (16) unacceptable. Such examples thus argue against obligatory reconstruction. ((17) is in fact incompatible with reconstruction even as an option.) On the other hand, (18)-(21) indicate that we need to assume it. (Nothing changes if *ti* ‘you’ follows the NCIs in (16)-(21).)

(18) ??*Nikoga tvrdiš da nije poljubio.*  
 nobody claim that neg+is kissed  
 “You claim that he did not kiss anyone.”

(19) \**Ikoga tvrdiš da nije poljubio.*

(20) ?*Ničija kola tvrdiš da nije ukrao.*  
 nobody’s car claim that neg+is stolen  
 “You claim that he did not steal anyone’s car.”

(21) \**Ičija kola tvrdiš da nije ukrao.*

While a bit degraded (18) is clearly better than (19). (18) improves if the NCI is embedded a bit (20). We seem to be dealing here with a similar effect as in (22).

(22)a. \**Anyone, he didn’t see.*  
 b. ??*Pictures of anyone, he didn’t see.*

Crucially, this kind of embedding cannot save (19) (cf. (21)). There is then another contrast between *ni/i*-NCIs. However, this contrast needs NCI reconstruction. We then seem to have a contradiction at our hands, with (18)-(21) requiring reconstruction and (16)-(17) incompatible with it. If we consider the data more closely, a generalization emerges: *ni*-NCIs are always acceptable in reconstruction contexts (regardless of whether we are dealing with clause-mate or long-distance negation) while *i*-NCIs are always unacceptable in reconstruction contexts (again regardless of whether we are dealing with clause-mate or long-distance negation).

It is clear that Progovac’s binding analysis cannot handle the above data no matter what assumptions we make regarding the possibility of satisfying binding requirements under reconstruction. E.g., if we allow it even as an option, which is necessary to account for (20), (17) cannot be accounted for. The fact is that NCIs behave differently from anaphors/pronouns under reconstruction, which provides evidence against the binding account. Note, however, that the data still confirm Progovac’s claim that *ni/i*-items are in complementary distribution.

The data also raise a problem for Progovac (2005). This work assumes a particular specification for NCIs for the [pos, neg] features, which forces NCIs to undergo feature checking with a Polarity Phrase (PolP) with the corresponding specification. Progovac assumes that *ni*-items are specified as [+neg] and *i*-items as [-neg, -pos]. She assumes that negative clauses (i.e. their PolP) like (23b) are specified as [+neg, -pos], non-negative clauses like (23a) as [-neg, +pos], and yes-no questions and conditionals like (2b) as [-neg, -pos], which also holds for the embedded CP in (23c). While the account captures the basic *ni/i* paradigm, a problem with it is that it is based on several stipulations concerning the feature specification of the elements in question. It appears that there is no deep reason for some of these stipulations. E.g., a question arises why the embedded clause in (23d) could not be specified as [-neg, -pos] (as in (23c)), which would incorrectly license the *i*-item.

- (23)a. \**Jovan voli nikoga/ikoga.*  
 Jovan loves nobody/anyone  
 b. *Jovan ne voli ?nikoga/\*ikoga.*  
 Jovan neg loves nobody/anyone  
 c. *Jovan ne tvrdi da Marija voli ?ikoga/\*nikoga.*  
 Jovan neg claims that Marija loves anyone/nobody  
 d. \**Jovan tvrdi da Marija voli ikoga/nikoga.*  
 Jovan claims that Marija loves anyone/nobody

However, the most serious problem for the account is raised by the reconstruction examples discussed above. Given (16) and (20), it must be possible to check the relevant features during movement; otherwise the *ni*-item could not be licensed in these examples. But then we would also expect (17) to be acceptable, with *ikoga* checking the relevant feature during the movement (or under reconstruction).

Progovac (1994, 2005) thus fails to account for NCI reconstruction. So, what is going on here? How can we handle the apparently contradictory reconstruction data? I will now show they can be captured under the account from sec. 1, which provides strong evidence for it. Recall that under that account, we get *ni*-items if NCIs move to SpecNegP overtly; otherwise we get *i*-items (so, *ni*-items require overt movement to SpecNegP, and *i*-items are incompatible with it).

Many authors have argued that successive cyclic movement targets every phrase on its way (Bošković 2002a, Boeckx 2003, Müller 2004, Manzini 1994, Takahashi 1994; see also Fox and Lasnik 2003 and Chomsky in press), a position I also adopt here. This means NCIs moving above SpecNegP, such as those in the reconstruction examples, must pass through SpecNegP. We then

have a principled explanation why *ni*-NCIs are always acceptable in reconstruction contexts, while *i*-NCIs are not. Such contexts always involve movement to SpecNegP, which *ni*-, but not *i*-NCIs are compatible with under the current analysis. I therefore conclude that the reconstruction data can be explained under the current analysis.

### 3. Complementary distribution breakdown

There is a context where the complementary distribution between *ni*- and *i*-NCIs breaks down. Progovac (1994) notes that both *ni*- and *i*-items are possible in the complement of *željeti* ‘want’ with long-distance negation, as (24) shows. Interestingly, this only holds for objects. Subject position allows only *i*-items (25).

- (24)a. ?*Marko ne želi da vidi nikoga.*  
 Marko neg wants that sees nobody  
 “Marko does not want to see anyone.”  
 b. ?*Marko ne želi da vidi ikoga.*

- (25)a. \**Marko ne želi da niko dodje.*  
 Marko neg wants that nobody comes  
 “Marko does not want for anyone to come.”  
 b. *Marko ne želi da iko dodje.*

Stjepanović (2004), Aljović (2005), and Progovac (1994) show we are dealing here with a restructuring context. One of Progovac’s arguments concerns (26).

- (26)a. *Šta<sub>i</sub> ne želiš da mi kažeš t<sub>i</sub>?*  
 what neg want that me tell  
 “What don’t you want to tell me?”  
 b. ??*Šta<sub>i</sub> ne kažeš/mišliš da voliš t<sub>i</sub>?*  
 what neg say/think that like  
 “What don’t you say/think that you like?”

While long-distance wh-movement is normally not possible across negation, it is possible with the verb *željeti* (26a). Notice first that without negation in the matrix clause, long-distance wh-movement is quite generally allowed, as shown in (27a). What we are dealing with here is an inner-island type effect, where negation induces a blocking effect for movement. As is well known, this type of effect is also present in English, but only with adjunct extraction ((27b), see also (30a)).

- (27) a. *Šta<sub>i</sub> kažeš/misliš da voliš t<sub>i</sub>?*  
 b. \**I wonder how John didn't fix the car.*

SC thus differs from English in that it exhibits inner island effects with argument extraction. The effect arises only in long-distance questions (with non-restructuring verbs). Short-distance wh-movement does not show it.

- (28) *Šta<sub>i</sub> ne voliš t<sub>i</sub>?*  
 what neg love  
 “What do you not love?”

The contrast can be captured if objects moving to SpecCP undergo object shift, as argued in Bošković (1997a) (see also Chomsky 2001). I show accusative NPs must move to SpecAgroP when moving to a higher position even when movement to SpecAgroP is not otherwise required based on (29). (29a) illustrates Superiority effects with Bulgarian multiple wh-fronting (MWF), the underlying assumption being that the wh-phrase that is first in the linear order is the one that moves first. Given this, (29b) indicates the object must be higher than the adjunct prior to wh-movement. This follows if the object must move first to SpecAgroP; it is then higher than the adjunct, which I assume is VP-adjoined, prior to wh-movement.

- (29)a. *Koj kogo e tselunal/\*Kogo koj e tselunal?*  
 who whom is kissed  
 “Who kissed whom?”  
 b. *Kogo kak e tselunal Ivan/?\*Kak kogo e tselunal Ivan?*  
 whom how is kissed Ivan  
 “How did Ivan kiss whom?”

Returning to (26b) and (28), we can account for the contrast given wh-movement via Spec AgroP and the assumption that AgroP is higher than negation, argued for in Takahashi (1994). *Šta* in (28) then crosses negation while undergoing A-movement, while *šta* in (26b) does it while undergoing wh-movement. Since inner island effects involve A'-spec intervention (see Rizzi 1990), the contrast in question is accounted for. Furthermore, given that in restructuring contexts the Case-position of the embedded object (SpecAgroP) is located in the higher clause, as argued in Wurmbrand (2001), long-distance extraction in (26a) is expected to pattern with (28) rather than (26b).

What about the SC/English contrast regarding inner island effects with argument wh-movement? It is standardly assumed English does not show such effects even with long-distance argument wh-movement (30a). Takahashi

(1994) notes this is actually incorrect. First, note that (30b) is ambiguous: negation can be interpreted either in the matrix or the embedded clause (negative raising (NR)).

- (30)a. *Which problem don't you think that John solved?*  
 b. *I don't think that John solved the problem.*

Takahashi notes (30a) only has the NR reading. He shows this can be captured under the wh-movement-via-AgroP analysis. Assuming negation is located in the lower clause on the NR reading and in the higher clause on the matrix reading, the wh-phrase in (30a) crosses negation on the NR reading while undergoing object shift (A-movement), and on the matrix negation reading while undergoing wh-movement. Since we are dealing here with an A'-movement intervention effect, it follows only matrix clause negation blocks wh-movement. Takahashi's analysis thus explains why (30a) has only the NR reading. It also makes a prediction: with non-NR verbs, instead of a missing reading we should get a degraded sentence. As Takahashi notes, the prediction is borne out, as (31), involving the non-NR verb *claim*, shows. Returning to SC, (26b) is degraded because *kazati/misliti* are non-NR verbs (see Bošković in press a, where it is shown that the relevant test involves strict clause-mate NPI licensing, not just lower clause interpretation).

- (31) ?? *Which problem didn't you claim that John solved?*

More evidence for restructuring with *željeti* is provided by long-distance clitic climbing, which is allowed only with restructuring. Progovac notes it is allowed with *željeti*, which confirms the restructuring account of the *da* clause with *željeti*.

- (32)a. *Milan želi/kaže da ga vidi.*  
 Milan wants/says that him sees  
 "Milan wants to see him/Milan says that he sees him."  
 b. ?*Milan ga želi da vidi.*  
 c. \**Milan ga kaže da vidi.*

Progovac notes that there are restrictions on such restructuring. Thus, the higher and the lower verb must agree in  $\Phi$ -features (compare (33a) and (32b)). Interestingly, *nikoga* is possible in the lower clause only with restructuring (33b).

- (33)a. \**Milan ga želi da vidiš.*  
 Milan him wants that see(2.sg)  
 “Milan does not want for you to see him.”
- b. \**Milan ne želi da vidiš nikoga.*  
 Milan neg wants that see(2.sg) nobody  
 “Milan does not want for you to see anyone.”

Let us see why. First, as usual, fronting of *nikoga* is also possible (cf. (24a). Note that overt subjects can either precede or follow fronted NCIs like *nikoga* in (34)).

- (34) *Nikoga ne želi da vidi.*  
 nobody-acc neg wants that sees

Recall that AgroP for the embedded object is located in the matrix clause with restructuring. Assuming SC has overt object shift (Bošković 1997b, Stjepanović 1999), *nikoga* in restructuring contexts moves to the matrix SpecAgroP (but see section 4 for alternative motivation for this movement). As discussed above, the movement passes through SpecNegP.<sup>6</sup> This is what happens in (34). I assume that the *ni*-option in (24a) can be handled either via remnant or rightward movement, which would occur after the point in the derivation reached in (34).

Recall that *ni*-items are impossible in the subject position of the lower clause (25). This is reminiscent of the well-known subject-object asymmetry in (35), which is restricted to subjunctives. (Progovac in fact treats (26) as a subjunctive/indicative contrast.)

- (35)a. *Je nái exigé qu'ils arrêtent personne.*  
 I neg-have required that-they arrest nobody
- b. \**Je nái exigé que personne soit arête.*  
 I neg-have required that nobody be arrested (French)

The account of the contrast in (24)-(25) in the current system is straightforward. As discussed above, the *ni*-item in (24a) moves to the matrix SpecAgroP, passing through SpecNegP, which is followed by either remnant movement of

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6 I assume that in the case of successive cyclic movement, whether an intermediate Spec (such as SpecNegP) counts as an A- or an A'-position depends on whether the movement in question is A or A', an assumption that is necessary in the current framework (see Bošković in press b.)

the material following *ni* or rightward movement of *ni*.<sup>7</sup> Regardless of which of the two options is taken, this analysis obviously cannot be applied to (25), where *ni* remains in the embedded clause, never moving to SpecNegP. Since there is no movement to SpecNegP, *ni*-items cannot occur in the context in question (25a).

(36) can also be accounted for; in fact, it should be interpreted as additional evidence for the current analysis. Like the subject *ni*-item in (25), the NCI in (36) must be located in the embedded clause; it could not have moved to SpecNegP. As a result, (36a) is unacceptable. Again, an *i*-item can occur here.

(36)a. \**Jovan ne želi da nikoga vidi.*

Jovan neg wants that nobody-acc sees  
 “Jovan does not want to see anyone.”

b. *Jovan ne želi da ikoga vidi.*

To sum up, restructuring contexts, where the complimentary distribution between *ni*- and *i*-items breaks down, can be accounted for in the current system. The optionality in (24) is a result of the optionality of restructuring, the restructuring option yielding *nikoga* and the non-restructuring option *ikoga* (see section 4 regarding the latter). We have seen that in all other positions only *i*-items are allowed in the complement of *željeti*. Since in the unacceptable examples with *ni*-items such as (25a) and (36a) the *ni*-items do not move to SpecNegP overtly, these data provide additional evidence for the current claim that *ni*-items must move to SpecNegP overtly.

#### 4. Back to *i*-items: Focus movement

Although the above analysis captures quite a bit of data, there is a glitch in it that needs to be fixed. Consider *i*-items, focusing on *ikoga*. (37) can be easily accounted for. Since in (37a), the NCI does not (in fact, cannot (see fn. 7) move to the matrix SpecNegP, *ikoga* is possible here. In (37b), *ikoga* moves above NegP. Since, as discussed above, it must pass through SpecNegP, *ikoga* is not possible here (recall that SHA between negation and NCIs yields *ni*-NCIs). (37c) does not contain negation, hence there is no SHA between the NCI and negation. (37d) is also straightforward. As discussed above, the example involves movement of the NCI above NegP (see below for its landing site),

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7 This derivation should not be available in indicatives (i.e. in non-restructuring contexts), or we would allow *ni* in (23c). Similar remnant movement derivations also need to be blocked for indicatives in Kayne’s (1998) system.

followed by NegP ellipsis. Since the movement must proceed via SpecNegP (see sec. 2), *ikoga* is impossible here.

- (37)a. *Ivan ne tvrdi da voli ikoga.*  
 Ivan neg claims that loves anyone  
 ‘Ivan does not claim that he loves anyone.’
- b. \**Ikoga Ivan ne voli.*  
 anyone-acc Ivan neg loves  
 ‘Ivan does not love anyone.’
- c. *Da li Ivan voli ikoga?*  
 ‘Does Ivan love anyone?’
- d. *Koga voli? ‘Who does he love?’ \*Ikoga. ‘Anyone.’*

So far so good. Consider, however, (38).

- (38) \**Ivan ne voli ikoga.*  
 Ivan neg loves anyone

*I*-items are not licensed here. We have seen NCIs in such examples may move to SpecNegP. To account for (38), we need the movement to be obligatory: If the NCI must move to SpecNegP, only *ni*-items can be licensed here. I therefore suggest *i*-items must undergo movement. There is independent evidence to this effect. Recall fronted examples are preferred to what seem to be in-situ examples with *ni*-NCIs. The same holds for *i*-NCIs. Examples like (37a), repeated here, are actually somewhat degraded, (39b) being preferred (see also Progovac 2005).<sup>8</sup>

- (39)a. ?*Ivan ne tvrdi da voli ikoga.*  
 Ivan neg claims that loves anyone-acc
- b. *Ivan ne tvrdi da ikoga voli.*

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8 As with *ni*-NCIs (see section 1), multiple *i*-NCI examples and examples like (ic) are disallowed.

- (i) a. \**On ne tvrdi da Marija daje išta ikome ikad.*  
 he neg claims that Marija gives anything-acc anyone-dat ever
- b. *On ne tvrdi da Marija išta ikome ikad daje.*
- c. ??*On ne tvrdi da je Marija predala ikome nju.*  
 he neg claims that is Marija given-up anybody-dat her-acc  
 ‘He does not claim that Marija gave her up to anyone.’
- d. *On ne tvrdi da je Marija ikome predala nju.*

As discussed above regarding *ni*-items, the contrast can be taken to be significant, indicating *i*-items must undergo movement. Alternatively, we can assume *ikoga* also undergoes leftward movement within the embedded CP in (39a), followed by remnant movement of the material below *ikoga*, or rightward movement of *ikoga*, the options being slightly marginal (they are responsible for the marginal status of (39a)). I will then proceed under the assumption that, like *ni*-items, *i*-items must undergo movement. What is the movement in question? The movement cannot involve scrambling, which is an optional operation, since it must be obligatory. (If *ikoga* in (38) could stay in situ we could not account for its ungrammaticality.) We also cannot maintain that *i*-items must move to SpecNegP given cases like (36b) and (39b) (recall that such examples are unacceptable with *ni* due to the lack of movement to SpecNegP). The following are, however, viable options:

1. We can assume SC is an *obligatory* object shift language (see Bošković 1997b and Stjepanović 1999 for relevant discussion), with AgroP located above NegP. Given the target-every-phrase approach to successive cyclic movement adopted above, *ikoga* then must move through SpecNegP, as desired. A potential problem under this approach concerns adjunct *i*-phrases like *ikad* ‘ever’, which also have to be forced to move (since they cannot co-occur with clause-mate negation). One possibility is to appeal to an analysis along the lines of Oka (1993), where adjuncts have a licensing requirement similar to Case, which forces them to move.
2. Another possibility is to adopt Progovac’s (2005) claim that there are two PolPs in a CP. The lower PolP would be headed by *ne* in (38) and *ikoga* would be forced to move to the higher PolP, passing through the Spec of the negation PolP.<sup>9</sup>
3. We can also adopt Citko’s (1998) claim that all indefinites must move to Spec OpP, located above NegP (she discusses Polish, but SC behaves like Polish in this respect). Given the traditional wh+indefinite account of wh-phrases, the fact that SC is a MWF language provides an argument in favor of Citko’s claim. In fact, even indefinites like the one in (40) are preferred in a fronted position in SC.

- (40) *Nešto je kupio.*  
 something-acc is bought  
 “He bought something.”

While these options all work, forcing *i*-NCIs to move, I would like to endorse another option which has independent morphological motivation. I suggest that

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9 This would be followed by remnant movement in (38), but not in \**Ikoga Ivan ne voli*.

*i*-NCIs (as well as *ni*-NCIs) must undergo focus movement to a FocP above NegP. The movement is forced to pass through SpecNegP, as discussed above.

The account has independent motivation. Consider the morphological make-up of SC NCIs. Both *ni*- and *i*-NCIs contain a *wh*-part and a focal marker (used independently as focal *even*). In addition, *ni*-NCIs contain *n*, which I argued is a reflex of SHA with negation.<sup>10</sup>

(41)  $n(\text{neg})+i(\text{focus ('even')})+ko(\text{who})$

What is important for us is that NCIs have a focal marker. It is well-known SC is an obligatory focus movement language, which moves all focalized phrases to a FocP overtly (Bošković 2002b, Stjepanović 1999). The presence of a focal marker should then force NCIs to move to FocP too. Since FocP is located above NegP (cf. (42a), where contrastively focused *Asmir* must precede negation), the NCI in (42b) must pass through SpecNegP. We now have an account of the impossibility of an *i*-NCI co-occurring with clause-mate negation. The obligatory movement to Spec FocP forces it to pass through SpecNegP, which then yields a *ni*-NCI. This is not the case with long-distance cases like (42c), since here an *i*-item can move to FocP within the embedded CP, hence it does not have to move to SpecNegP.

- (42)a. *ASMIRA ne voli.*  
 Asmir-acc neg loves  
 “He does not love ASMIR.”
- b. [<sub>FocP</sub> [<sub>NegP</sub> NCI
- c. [<sub>NegP</sub> [<sub>CP</sub> [<sub>FocP</sub> NCI

What is appealing in this account, and argues in its favor, is that all movement is morphologically motivated: *i* motivates movement to FocP, and *n* to SpecNegP.<sup>11</sup>

Additional evidence for the above analysis is provided by the distribution of NCIs in infinitives. As shown by (43), only *ni*-items can occur in this context.

10 Recall that the morphology does not have to be transparent in every language where the above mechanisms are at work (see fn. 3). A language where these mechanisms are not reflected in the morphology would not argue against the above analysis, it would merely fail to provide one argument for it. (It is in fact possible that (40) involves focus movement that is not reflected in the morphology. Alternatively, it may be possible to analyze *nešto* as *ne+i+što*, with *i*-deletion. Or the movement in question could be independent of focalization.)

11 I assume that the morphology does not have to reflect the order of checking, which is more or less the standard assumption in the feature-checking approach.

- (43) *Asmir ne želi vidjeti ?nikoga/\*ikoga.*  
 Asmir neg wants to-see nobody/anyone  
 “Asmir does not want to see anyone.”

Stjepanović (2004) shows that SC infinitives must involve restructuring, which means that all functional structure that is normally located within a non-restructuring infinitive is located in the higher clause (following Wurmbrand 2001). I refer the reader to Stjepanović for relevant discussion, merely noting that negation also cannot occur in the infinitive, which is consistent with the above claim that functional structure must all be located in the higher clause due to obligatory restructuring with SC infinitives.

- (44) *Asmir ne želi vidjeti Milenu/\*Asmir želi ne vidjeti Milenu.*  
 Asmir neg wants to-see Milena  
 “Asmir does not want to see Milena/Asmir wants not to see Milena.”

In fact, NCIs cannot front within the infinitive (45), which indicates the phrase hosting obligatory NCI movement cannot be located within the infinitive either.

- (45) *\*Asmir ne želi nikoga/ikoga vidjeti.*  
 Asmir neg wants nobody/anyone to-see  
 “Asmir does not want to see anyone.”

As expected, focus movement of other XPs also cannot land within the infinitive.

- (46)a. *?\*Asmir (ne) želi MILENU vidjeti.*  
 Asmir neg wants Milena-acc to-see  
 “Asmir does not want to see MILENA.”  
 b. *MILENU Asmir (ne) želi vidjeti/Asmir MILENU (ne) želi vidjeti.*

The obvious conclusion is that NCIs must move (i.e. undergo focus movement) outside of the infinitive. Since the movement must proceed via SpecNegP, only *ni*-items are possible in infinitives, as shown by (47). (In (43), this movement is followed by remnant NegP fronting or rightward movement, as discussed above).

- (47) *Asmir nikoga/\*ikoga ne želi vidjeti.*  
 Asmir nobody/anyone-acc not wants to-see

Recall that the *da*-complement of *željeti* can optionally undergo restructuring.<sup>12</sup> When the restructuring option is forced via clitic climbing (Stjepanović 2004 shows clitic climbing requires restructuring, though the failure of a clitic to climb does not prevent restructuring), neither an *i*-NCI nor an XP undergoing focus movement can occur in the complement of *željeti* (48a-b). Negation is also impossible (48c), and nothing changes regarding NCI licensing in (48d).

- (48) a. *Milan mu ne želi da predstavi ?nikoga/\*ikoga.*  
 Milan him-dat neg wants that introduces nobody-acc/anyone-acc  
 “Milan does not want to introduce anyone to him.”
- b. ?\**Milan mu želi da MILENU predstavi.*  
 Milan him-dat wants that Milena-acc introduces
- c. \**Milan mu želi da ne predstavi Milemu.*  
 Milan him-dat wants that neg introduces Milena-acc
- d. *Milan mu nikoga/\*ikoga ne želi da predstavi.*

These data can be accounted for in the same way as the corresponding data with infinitives. Note also that, as expected, *i*-NCIs, focus movement and negation can all occur in the complement of *željeti* on the non-restructuring option (lexical subjects in the complement of *željeti* are compatible only with this option).

- (49) a. *Milan ne želi da Marija ikoga predstavi.*  
 Milan neg wants that Marija-nom anyone-acc introduces  
 “Milan does not want for Mary to introduce anyone.”
- b. *Milan želi da Marija PETRA ne predstavi.*  
 Milan wants that Milena-nom Petar-acc neg introduces

To sum up, I have offered a simple account of the *ni/i* alternation, where all movement NCIs undergo is morphologically motivated. In addition to accounting for Progovac’s clause-mate/higher negation data, the current analysis accounts for the curious behavior of NCIs under reconstruction (only *ni*-items are compatible with it, and it is irrelevant whether reconstruction takes place into a clause-mate or a higher negation context), the behavior of NCIs in non-negative contexts (only *i*-items are possible there) and ellipsis (only *ni*-items are possible there).

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12 *Da* with restructuring should not actually be treated as a complementizer (see Stjepanović 2004).

## 5. Implementation

I now turn to the implementation of the above analysis, which will involve discussing its technical details. In section 1, I discussed two options, where *ni*-items are located in SpecNegP or a higher position. The above considerations favor the latter. Consider the former option: To account for the fact that all *ni*-items move, we would need to assume that Neg has an EPP feature with Bošković's (1999) Attract All property (see Brown 2005), which can be satisfied only if Neg attracts all NCIs (which are not already located in SpecNegP). Consider now how this would be implemented in Bošković's (in press b) system, which deduces EPP effects from the assumption that an uninterpretable feature (uK) must be a probe (see also Epstein and Seely 2006); more precisely, a uK can be checked iff the element containing it c-commands the checker. (50a) is then ruled out because the uCase of *John* cannot be checked since *John* does not c-command *I*. The problem does not arise in (50b), where *John* moves to a position c-commanding *I*, hence can probe *I*, checking its uCase. Under this analysis, Case (in fact any uK) cannot be checked via Agree; the analysis requires movement to the Spec of the Case licenser (i.e. movement to the closest position c-commanding it, which is its Spec). (50c) provides evidence for the analysis. As noted in Bošković (in press b), (50c) raises a serious problem for Chomsky's (2001) system, where Case can be checked by Agree. *What* cannot be Case-checked in the lower clause, *seem* not being a Case checker. But *know* (i.e. its *v*) can check Case. Why is then *know* apparently unable to Case-check *what*? (Appealing to some kind of a ban on verbs undergoing Agree with elements in A'-positions will not work here, since in a number of languages a verb undergoes object agreement with an NP in SpecCP; i.e., a verb can agree with an NP in SpecCP, it only cannot Case-mark it). In Bošković's (in press b) system this is straightforward. *What* in (50c) can only be Case-checked if it moves to the matrix SpecvP, c-commanding its Case licenser. This in itself is not a problem given that, as argued in Bošković (in press b) and references therein, English has object shift. However, the problem is that *what* would then be located outside of its scope (embedded CP), which, as is well-known (see Saito 1992), is disallowed.

- (50) a. \**Was arrested John*.  
 b. *John was arrested*.  
 c. \**I know what it seems clear*.

Returning to NCIs, positing a uK on NCIs that must be checked against Neg, which then forces movement to SpecNegP, easily handles *ni*-items. However, there is a problem with *i*-items if they are considered to be the same lexical

items, since they would then always have to move to SpecNegP too. The same problem arises under the Attract All account, since if *ni/i*-items are the same lexical elements, they would all be attracted to SpecNegP. Under this analysis we then have to conclude that *i*-items do not have the relevant feature, i.e. the feature that is attracted by the Attract All property of Neg (so they are not candidates for movement under this account), or that they do not have the uK feature that forces the movement in question under the uK-as-a-probe analysis. In other words, this analysis is incompatible with the same lexical item approach to *ni/i*-NCIs. However, even with this assumption the analysis still does not work because of examples like (38) since under the analysis in question we cannot force movement of *ikoga* to SpecNegP.

Here is then an alternative that is also consistent with the single lexical item view: Neg does not drive anything. There is always movement (for other reasons, i.e. focus) to a phrase above NegP for both *ni*- and *i*-items. (Either the Attract-all EPP or the uK-must-be-a-probe option can be employed to drive this movement.) The movement must pass through NegP (due to locality), which gives us *n*.

We have thus teased apart options (6)-(7) from section 1, favoring the movement-above-NegP option. The movement in question is focus movement.

## 6. Back to ellipsis

I now return to ellipsis, where only *ni*-items occur. We have seen this can be accounted for if (51) involves movement of the NCI, followed by NegP ellipsis.

- (51) *Šta si kupio?* ‘What did you buy?’ *Ništa nisam—kupio.* ‘Nothing.’  
 what are bought nothing neg+am bought

Consider the semantics of NCIs/negation. Giannakidou (1998) argues negative concord items are not inherently negative, which means there must be a negation in the elided part of (51). Non-negative sentences must then be able to serve as ellipsis antecedents for negative sentences, which raises a potential problem for recoverability of deletion. Watanabe (2004) notes another problem. Consider (52).

- (52)a. *Šta si vidio?* ‘What did you see?’ b. *Zmiju* ‘Snake.’  
 c. *Zmiju sam vidio.* d. *Zmiju nisam—vidio.*  
 snake am seen snake neg+am seen

If a non-negative sentence can serve as an ellipsis antecedent for a negative sentence, we can have negation in the elided part of (52b); i.e. (52b) should be

able to stand for either (52c) or (52d). (52b) is then incorrectly predicted to allow interpretation ‘I did not see a snake’. The data lead us to conclude that negative interpretation comes from negative concord items. There should then be no negation in the elided part of (51) and (52b). Only (51), which contains an NCI, can then have negative interpretation. However, we are still facing a problem. If negative interpretation comes from NCIs the neg feature of NCIs must be interpretable. This also must be the case for the neg feature of negation, otherwise (53) would not have negative interpretation. But if both negation and an NCI have negative interpretation, a combination of the two in the same clause should lead to the unattested double negation reading, not negative concord reading.

(53) *Marko ne radi.*  
Marko neg works

(54) negation (iNeg) ... negative concord item (iNeg) = double negation!

(5) is then incorrectly predicted to mean ‘He loves someone’. To deal with the problem, Watanabe (2004) proposes a feature-copying mechanism, which introduces a complication into the feature-checking system. He assumes that both NCIs and negation have iNeg. He suggests the iNeg feature of the NCI is copied into the negation, which then has two interpretable neg features. They cancel each other out and we end up with only one interpretable neg feature, in the NCI itself.

(55) Neg(iNeg) NCI(iNeg) → Neg(iNeg, iNeg) NCI(iNeg) → Neg NCI(iNeg)

I would like to propose an alternative which does not need any additional mechanisms.<sup>13</sup>

Given the ellipsis data, NCIs must have iNeg (i.e. their Neg feature must be interpretable).<sup>14</sup> To avoid the double negation problem (see (54)), negation in

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13 The following is thus meant to replace Watanabe’s feature-copying mechanism, as well as Haegeman and Zanuttini’s (1996) neg-factorization, which Watanabe replaces with his feature-copying, in negative doubling. However, as Watanabe notes, a residue of neg-factorization (see de Swart and Sag 2002 for a potential alternative) may be needed for cases involving multiple NCIs (i.e. negative spread). See Watanabe for a suggestion how to confine the mechanism to this case.

14 If *ni/i*-items are the same lexical elements this would have to be a more general feature (see Progovac 1994 for relevant discussion) which would yield negative interpretation when it undergoes checking with negation. (Alternatively, it is not out of question that *i*-NCIs licensed by negation and *i*-NCIs licensed by non-negative elements are different

NCI contexts then must have uNeg. What about (53)? Negation here clearly must have iNeg since otherwise we would incorrectly allow non-negative interpretation for (53). There is then an easy solution to the negation interpretation problem: There are two negative heads, Negation A and Negation B, one having iNeg, and the other uNeg.<sup>15</sup> A negative sentence will have either Neg A or Neg B. (The lack of Neg B in a language will lead to the lack of negative concord.)

(56) Negation A: iNeg                      Negation B: uNeg

We now need to ensure that we get the right distribution for the negative heads: Neg B should not occur in (53) (or (53) would be allowed to have a non-negative interpretation), and Neg A should not occur with NCIs (or NCI examples would allow double negation reading). Let us see how this can be achieved.

I adopt the standard assumption that X cannot probe unless it has a uK (without it, Last Resort would prevent it from probing). I also adopt Chomsky's (2001) Activation Condition, which says that Y must have a uK to be visible for movement/agreement (see also Bošković in press b). NCIs (from now on, I use the term for *ni*-items (but see fn. 14 and 16)) then must have the following feature specification (see Bošković 2005 and Watanabe 2004 for independent evidence for a uK in negative elements).<sup>16</sup>

(57) NCI: iNeg, uK

I assume that just like the Case of NPs is checked as a reflex of feature checking with Tense/*v* (Chomsky 2001), the uK of NCIs is checked as a reflex of neg feature checking with negation.<sup>17</sup>

Recall that we need to prevent Neg A from co-occurring with NCIs. If this were an option we would incorrectly get a double negation reading in NCI examples. This is now easily accomplished: Neg A cannot co-occur with an NCI

lexical items, where only the former are subject to the unified analysis with *ni*-NCIs discussed in the text (which means that (57) would hold only for them). Under this analysis, SC *ni*-NCIs and negative *i*-NCIs would be the counterpart of Turkish (non-partitive) NCIs, which are licensed by negation (clause-mate or superordinate), but not non-negative licensors (see Progovac 1994.)

15 Neg B could be Van der Wouden's (1997) identity function negation.

16 The uK could be in principle checkable by negation and non-negative licensors Progovac (1994) discusses (regarding *i*-NCIs), the SpecNegP requirement on *ni*-NCIs (which involves uK checking by Neg) being responsible for the incompatibility of *ni*-NCIs with the non-negative licensors (but see fn. 14 for an alternative where the issue of licensing by non-negative elements does not arise).

17 I will couch the account in Chomsky's (2001) terms, but it can be updated to my system (Bošković in press b).

since it cannot serve as a probe because it does not have an uninterpretable feature. Since Neg A would not probe the NCI, the uK of the NCI remains unchecked. The problem does not arise with Neg B, which has an uninterpretable feature hence can function as a probe. We have thus ensured that only Neg B can co-occur with NCIs. The other half of our job is also done. Recall that since the neg feature of Neg B is uninterpretable we should not be able to use it in (53), or (53) could mean *Marko works*. But Neg B cannot be used in this context since its uNeg feature would remain unchecked. Because of this, Neg B can only be used with an NCI, which will check its uNeg feature. This checking relation will also result in the checking of the uK of the NCI. NCIs can then be used only with Neg B because of this. We have therefore ensured exactly the right distribution for the two negative heads.

Returning to ellipsis, it should be obvious now that we need negation in the elided part of (51) and that it must be Neg B (without it the uK of the NCI would not be checked). Note, however, that given that the identity condition on ellipsis is semantic (see Merchant 2001), there is no problem with taking a non-negative sentence to be an antecedent for a negative sentence here since the relevant part is not semantically negative (the neg feature in question is uninterpretable). Recall that Watanabe (2004) argued that negation should not be allowed in the elided part of (51) or we would allow negation in the elided part of (52b), incorrectly predicting (52b) to allow interpretation ‘I did not see a snake’. The problem does not arise in the current system. (52) is quite different from (51), since in (52) we have to use Neg A. (If we were to use Neg B, its uNeg feature would remain unchecked. The neg feature of Neg A has semantic import (it is interpretable), hence a clause containing it cannot be deleted under identity with a non-negative clause (recall that the parallelism requirement is semantic). We have therefore succeeded in resolving Watanabe’s problem without positing additional feature-checking mechanisms.

Let me finally note that if a negative element has iNeg but no uK, it would not require negation, and if negation is present we would get a double negation reading. Such elements could not co-occur with Neg B, which is a prerequisite for the negative concord reading, since being inactive (i.e. lacking uK) they could not check the uNeg of Neg B. English *I saw nothing* may instantiate this type.

## 7. Conclusion

To sum up, I have argued for a simple account of the *ni/i* alternation where we get *ni* when NCIs move to SpecNegP. I have provided a number of arguments that *ni*-NCIs must undergo this movement while *i*-NCIs are incompatible with it based on reconstruction, restructuring, and ellipsis. In addition, both *ni* and *i*-

NCIs undergo focus movement, FocP being higher than clause-mate NegP. All movement NCIs undergo is morphologically motivated. The current analysis explains the behavior of NCIs with respect to negation (*i*-NCIs occur with long distance and *ni*-NCIs with clause-mate negation), non-negative licensors (only *i*-NCIs are possible there), ellipsis (only *ni*-NCIs are possible there), and reconstruction (only *ni*-NCIs are possible under reconstruction, a pattern which was shown to raise a serious problem for alternative accounts). I have also proposed a new account of negative concord based on the existence of two negative heads.

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*Carlos de Cuba and Ivana Mitrović*

## Restrictions on *wh*-adjunct movement in Serbian\*

### 1. Introduction

This paper is an examination of *wh*-adjunct movement in the Serbian variety of Serbo-Croatian (SSC).<sup>1</sup> The goals are twofold: First, to present SSC long-distance *wh*-movement data that, as far as we know, have not received a formal analysis in the literature. We show restrictions on adjunct movement and ordering in long-distance vs. short-distance *wh*-movement. Second, we present an analysis that captures these restrictions without losing the benefits of previous analyses of short-distance *wh*-movement, such as Rudin (1988) and Bošković (1997a, 1998, 2003).

It has been widely noted in the literature that Serbo-Croatian (SC) is a multiple *wh*-movement language. In matrix questions the Superiority Condition is violated, and any *wh*-phrase order is allowed, as in (1). This ordering freedom also holds for adjuncts like *zašto* ‘why’, which can appear in the first, second or third position among *wh*-phrases.<sup>2</sup>

- (1) a. *Ko je koga zašto istukao?* [SC]  
       who AUX whom why beaten  
       ‘Who beat whom and why?’  
       b. *Ko je zašto koga istukao?*  
       c. *Koga je ko zašto istukao?*  
       d. *Koga je zašto ko istukao?*  
       e. *Zašto je ko koga istukao?*  
       f. *Zašto je koga ko istukao?*

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\* Many thanks to the organizers and participants at FDSL 6.5 (University of Nova Gorica, December 2006) and The Novi Sad Generative Syntax Workshop (University of Novi Sad, January 2007) for stimulating questions and discussion. Thanks also to two anonymous reviewers for helpful comments and suggestions.

1 Note that throughout this paper we refer to ‘Serbian Serbo-Croatian’ (SSC) when discussing the new data we present, but ‘Serbo-Croatian’ (SC) when reporting data presented elsewhere as Serbo-Croatian. We use ‘Serbian’ because all of our native informants are from Novi Sad, Serbia, and we suspect there are regional dialectal differences. We leave a much-needed comprehensive study of other varieties of Serbo-Croatian to future research.

2 In all of the examples in (1) the focus is on the *wh*-phrase that comes first, i.e., it is the information that interests us the most.

While ordering is free in SC short-distance multiple *wh*-movement, there are restrictions on adjunct positioning in long-distance multiple *wh*-movement. As illustrated in (2), a *wh*-adjunct (*wh*-adj) must appear to the left of a *wh*-argument (*wh*-arg).

- (2) Restriction #1: Adjuncts Must Appear to the Left of Arguments
- a. *Zašto koga tvrdiš* [*da je Marko istukao t t*]? [SSC]  
 why whom claim-2sg that AUX Marko beaten  
 ‘Why do you claim that Marko has beaten whom?’
- b. \**Koga zašto tvrdiš* [*da je Marko istukao t t*]?

In addition, while adjuncts can front freely in short-distance *wh*-movement regardless of the matrix verb, there is another restriction on long-distance *wh*-movement, namely the familiar adjunct vs. argument asymmetry when extracting from non-factive vs. factive complements.<sup>3</sup> Non-factive complements allow adjunct extraction (3a), but non-factive complements do not (3b).<sup>4</sup>

- (3) Restriction #2: Factive Islands
- a. *Zašto tvrdiš* [*da si Nenadu dao knjigu t*]? [SSC]  
 why **claim**-2sg that AUX to-Nenad given book  
 ‘Why do you claim that you gave a book to Nenad?’
- b. \**Zašto znaš* [*da si Nenadu dao knjigu t*]?  
 why **know**-2sg that AUX to-Nenad given book  
 ‘Why do you know that you gave a book to Nenad?’

Our goal in this paper is to propose an analysis of long-distance *wh*-movement in SSC that accounts for the restrictions on adjunct movement in (2) and (3). The paper is organized as follows. In Section 2, we present previous analyses of multiple *wh*-movement. While the analyses presented account nicely for short-distance multiple *wh*-movement, they don’t say anything about the adjunct

3 It is crucial to note that in all of the adjunct *wh*-movement examples in this paper, the judgments given are with the *wh*-adjunct construed with the embedded predicate, not the matrix predicate. In other words, all our examples are with the adjunct moving long-distance.

4 Two classes of Serbian factive verbs differ in the complementizers they take. Emotive factive verbs like *žališ* ‘regret’ take the complementizer *što*, while semifactives like *znaš* ‘know’ take *da*. This difference in morphological form does not translate into a difference in extraction behavior, with (i) being ungrammatical just like (3b).

(i) \**Zašto žališ što si Nenadu dao knjigu t*?  
 Why regret-2<sup>nd</sup> that AUX to-Nenad given book

Both emotive and semifactive complements create factive islands. Non-factives consistently take the complementizer *da* and allow adjunct extraction.

extraction data in (2) and (3). In Section 3, we examine the restriction in (3), that factive complement clauses are islands for adjunct extraction. We show that a previous analysis of Factive Islands (de Cuba 2006a) can account for this extraction asymmetry. An extra syntactic projection associated with non-factive predicates opens an escape hatch for adjunct extraction that is unavailable with factive predicates. In Section 4, we examine the restriction in (2), that long-distance extracted adjuncts must appear to the left of long-distance extracted arguments. We argue that adjunct and argument movement proceed in different manners, and this, coupled with the proposal for extra structure in Section 3, correctly predicts the word order facts in (2). In Section 5 we present a brief summary.

## 2. Previous Analyses of Multiple *Wh*-movement

Rudin (1988) proposes that there are two types of multiple *wh*-movement languages, the Bulgarian-type, illustrated in (4), and the SC-type, illustrated in (5) (Structures from Stjepanović (2003)).

- (4) a. [<sub>CP</sub> Koj kogo [<sub>IP</sub> *vižda?* ]] [Bu]  
           who whom sees  
           ‘Who sees whom?’  
       b. \* [<sub>CP</sub> Kogo koj [<sub>IP</sub> *vižda?* ]]
- (5) a. [<sub>CP</sub> Ko [<sub>IP</sub> koga *vidi?* ]] [SC]  
           who whom sees  
           ‘Who sees whom?’  
       b. [<sub>CP</sub> Koga [<sub>IP</sub> ko [*vidi?* ]]]

Rudin argues that in Bulgarian-type languages, all *wh*-phrases are fronted to Spec-CP, as in (4a). The first *wh*-phrase moves to Spec-CP, and the others are right-adjoined to Spec-CP. The order of fronted *wh*-phrases in Bulgarian follows from the Superiority Condition. Chomsky’s (1973:246) original formulation of the condition, given in (6), accounts for the contrast between grammatical (4a) and ungrammatical (4b), which violates Superiority.

- (6) *The Superiority Condition*: No rule can involve X, Y in the structure ... X ... [... Z ... -WYV ...] ... where the rule applies ambiguously to Z and Y, and Z is superior to Y. (The category A is superior to the category B if every major category dominating A dominates B as well but not conversely).

Rudin argues that in SC-type languages however, only the first *wh*-phrase moves to Spec-CP, and the rest are adjoined to IP, as in (5a). As shown in (5b), the Superiority Condition can be violated (as is also shown in (1)).

Following Rudin, Bošković (1997a, 1998, 2003) and Stjepanović (1998, 2003) argue that in SC short-distance multiple *wh*-movement, movement is adjunction to IP as opposed to movement to CP. This movement is not driven by a [+*wh*] feature, but by focus. Bošković (1998) argues that focus movement is insensitive to Superiority because the movement is driven by a strong feature on the *wh*-phrases, not by a strong feature on the target as in *wh*-movement. Therefore, there are no economy violations for different orders of focus movement (there are no ‘shorter moves’ to get all of the *wh*-phrases up, so whatever order the *wh*-phrases move to IP in is equally economical). This is in contrast to *wh*-movement to CP (driven by a [+*wh*] feature), which can be satisfied with a shorter move (movement of the closest *wh*-phrase is more economical). The free ordering in (1) thus results from focus movement.<sup>5</sup> Bošković (1997a, 1998, 2003) argues that in SC long-distance multiple *wh*-movement, Superiority effects arise whenever C is overt. This can be observed in long-distance questions (7), embedded question contexts (8), and matrix questions with an overt complementizer (9).<sup>6</sup>

(7) Superiority in Long-distance MWM

- a. *Ko koga tvrdiš [da je istukao?]* [SC]  
 who whom claim-2sg that AUX beaten  
 ‘Who do you claim beat whom?’
- b. \**Koga ko tvrdiš [da je istukao?]* (Bošković, 1997a:5)

5 Bošković (1997a, 1998, 2003) analyzes all movement of *wh*-phrases in (1) as focus movement to IP-adjoined positions. For him, any *wh*-movement to Spec-CP in SC would bring about Superiority effects, which would incorrectly predict ungrammaticality for (1c-f). An anonymous reviewer brought up the possibility that this would be a problem for clitic placement in (1c-f) if one assumes that second position clitics like *je* in SC are head adjoined to the head in between the top-most and the second *wh*-phrase. If all the *wh*-phrases are adjoined to IP, there's no intervening head position for the clitics. However, Bošković (2001, 2003) argues that the only requirement for second position clitics in SC is that they occur in the second position of their intonational (I)-phrase. He argues that in some cases a second position clitic can be pronounced between two *wh*-phrases when a lower copy of one of the *wh*-phrases spells out.

6 Note that the judgments in sentences like (7) do not hold for our informants, who either did not accept long-distance multiple *wh*-movement at all, or accepted both (7a) and (7b) as grammatical. For those who do accept long-distance multiple *wh*-movement, the inverted order of *wh*-phrases it is just a matter of different focus. We leave this interesting case of microvariation to future work.

- (8) Superiority in Embedded contexts
- a. *Ima ko šta da ti proda.* [SC]  
 has who what that you sells  
 ‘There is someone who can sell you something.’
- b. \**Ima šta ko da ti proda.* (Stjepanović, 2003:4, citing Bošković)
- (9) Superiority in Root questions with overt C
- a. *Ko li šta kupuje?* [SC]  
 who C what buys  
 ‘Who on earth buys what?’
- b. \**Šta li ko kupuje?* (Stjepanović, 2003:4, citing Bošković)

Bošković argues SC is like French, which has *wh*-in-situ. This *wh*-in-situ is only mandatory under certain conditions, namely when C is overt. In (7) and (8) C is overtly filled by the complementizer *da*, while in (9) C is overtly filled by the complementizer *li*. Thus, SC only obeys Superiority in conditions where French would have obligatory *wh*-movement.

A Bošković-style analysis accounts well for the superiority facts above. However, Bošković does not discuss the adjunct data in (2) and (3). In the next section, we examine Restriction #2 (Factive Islands), and then return to Restriction #1 (adjunct ordering in long distance multiple *wh*-movement) in section 4.

### 3. Restriction #2: The Factive vs. Non-factive Asymmetry

The first restriction on adjunct movement that we shall consider was given in (3), and is repeated here as (10). Adjuncts cannot be extracted from factive complement clauses.

- (10) Restriction #2: Factive Islands
- a. *Zašto tvrdiš [da si Nenadu dao knjigu t]?* [SSC]  
 why **claim**-2sg that AUX to-Nenad given book  
 ‘Why do you claim that you gave a book to Nenad?’
- b. \**Zašto znaš [da si Nenadu dao knjigu t]?*  
 why **know**-2sg that AUX to-Nenad given book  
 ‘Why do you know that you gave a book to Nenad?’

The restriction in (10) is a familiar one, mirroring the Factive Island data from Mainland Scandinavian languages (among others) in (11) and (12).

- (11) Non-factives – adjunct extraction OK
- a. *Hur tycker du* [<sub>CP</sub> *att du oppträdde t* ]? [Sw]  
How think you that you behaved
  - b. *Hvordan tror du* [<sub>CP</sub> *at du oppførte deg t* ]? [No]  
How think you that you behaved REFL
  - c. *Hvordan synes du* [<sub>CP</sub> *at du opførte dig t* ]? [Da]  
How think you that you behaved REFL
  - d. *How do you think* [<sub>CP</sub> *that you behaved t* ]?
- (12) Factive Islands - adjunct extraction BAD
- a. \**Hur ångrar du* [<sub>CP</sub> *att du oppträdde t* ]? [Sw]  
How regret you that you behaved
  - b. \**Hvordan angrer du* [<sub>CP</sub> *at du oppførte deg t* ]? [No]  
How regret you that you behaved REFL
  - c. \**Hvordan fortryder du* [<sub>CP</sub> *at du opførte dig t* ]? [Da]  
How regret you that you behaved REFL
  - d. \**How do you regret* [<sub>CP</sub> *that you behaved t* ]?

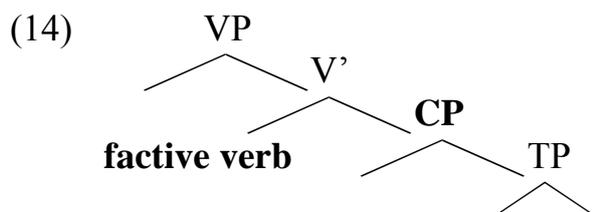
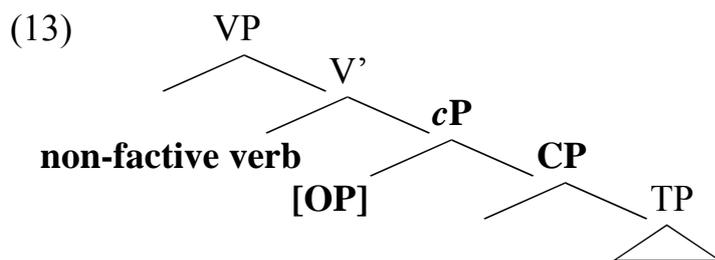
To account for the restriction in (10), we appeal to a previous analysis of English and Mainland Scandinavian Factive Islands presented in de Cuba (2006a). In this analysis, which we apply to SSC Factive Islands in this section, adjunct extraction from non-factive complements is allowed by the presence of an extra syntactic projection in the CP-field. We provide motivation for this extra structure in Sections 3.1 and 3.2, and show how this extra structure allows for adjunct extraction in Section 3.3.

### 3.1. Evidence for Extra Structure Associated with Non-factives

Kiparsky & Kiparsky (1971) provide the classic analysis of factive and non-factive clausal complementation. For them, factives are associated with an extra syntactic projection that is not present under non-factives (an NP with the head noun *fact*). However, a growing number of researchers are exploring the idea that the opposite holds: that it is actually non-factives that have more complex syntactic structure associated with their complements, not factives (Haegeman 2006; McCloskey 2005; de Cuba & Ürögdi 2001; de Cuba 2002, 2006a, 2006b, forthcoming). The structures for non-factive and factive complementation respectively proposed by de Cuba (2006a, 2006b) are given in (13) and (14).<sup>7</sup>

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7 For arguments against a Kiparsky & Kiparsky-style analysis of factives vs. non-factives and in favor of the Haegeman/McCloskey/de Cuba/de Cuba & Ürögdi view, see de Cuba (forthcoming).



Evidence for the existence of an extra layer of syntactic structure (*cP*) in the CP-field selected by non-factive predicates comes from Mainland Scandinavian (MSc). In Swedish, a verb-second language, embedded clauses typically do not have verb-second order, as illustrated in the examples in (15), where the finite verb appears in third position (following negation). However, embedded verb-second (EV2) is allowed under non-factive predicates, as in (16a), but not under factives, as in (16b). EV2 is optional in MSc.

- (15) a. *Rickard sa [att han inte var hemma].* [Sw]  
 Rickard said that he not was home  
 ‘Rickard said that he was not home.’
- b. *Rickard ångrade [att han inte var hemma].*  
 Rickard regretted that he not was home  
 ‘Rickard regretted that he was not home.’
- (16) a. *Rickard sa [att han var inte hemma].* [Sw]  
 Rickard said that he was not home  
 ‘Rickard said that he was not home.’
- b. \**Rickard ångrade [att han var inte hemma].*  
 Rickard regretted that he was not home  
 ‘Rickard regretted that he was not home.’

EV2 in MSc has also been analyzed as involving CP-recursion (see Vikner 1995; Holmberg & Platzack 1995; and Iatridou & Kroch 1992; among others). The two CP layers are needed to account for EV2 movement (widely analyzed as involving verb movement to the C head, and XP movement to Spec CP) in the presence of an overt complementizer (analyzed as residing in the head of the higher CP in the recursive structure). The structures proposed by de Cuba in (13)

and (14) accommodate this movement. Only in the non-factive structure in (13) is EV2 possible, with the overt complementizer in *cP*, and classic V2 movement to CP. The factive structure in (14) does not have the extra CP-field position to accommodate both the complementizer and V2 movement, ruling out (16b).

De Cuba (2006a, 2006b) presents data from Hungarian to further support the hypothesis that there is extra structure in non-factive constructions.<sup>8</sup> The pronominal *azt* appears in non-factive constructions like (17a), but is not available in factive constructions like (17b).<sup>9</sup>

- (17) a. *Azt<sub>t</sub> hiszem* [<sub>cP</sub> *t<sub>azt</sub>* [<sub>CP</sub> *hogy Mari okos.*]] [Hu]  
 it-ACC I-think that Mary smart-is  
 'I think that Mary is smart.'
- b. (\**Azt*) *sajnálom* [<sub>CP</sub> *hogy Mari okos.*]  
 it-ACC I-regret that Mary smart-is  
 'I'm sorry that Mary is smart.'

In (17a), *azt* represents the object of the matrix verb, which is the embedded CP.<sup>10</sup> The fact that *azt* bears accusative case provides evidence that it originates as an argument of the matrix verb. De Cuba argues that *azt* originates in *cP*, which explains why it is available in (17a) but not (17b). We take the Swedish and Hungarian data in this section as evidence for a more complex structure for non-factive complements (contra Kiparsky&Kiparsky), as proposed in (13).

### 3.2. McCloskey (2005): The Adjunction Prohibition

McCloskey (2005) also argues for a more complex CP-field structure under non-factives as opposed to factives. He shows that unlike in Standard English (SE), Subject Auxiliary Inversion is possible in Irish English (IE) polar questions (18a) and *wh*-questions (18b). However, as example (18c) shows, Subject

8 We use the terms 'factive' and 'non-factive' loosely here. For arguments that the factive/non-factive distinction is not the correct one, see de Cuba (forthcoming). For the present discussion, the terms will suffice.

9 If the sentences have neutral intonation, then factive predicates do not allow *azt*, while non-factives do. However, if *azt* is in contrastive focus position and heavily stressed, it is grammatical, as in (i) (Enikő Tóth, Barbara Ürögdi, p.c.).

(i) *AZT sajnálom, hogy Mari megbukott a vizsgán.*  
 it-ACC I-regret that Mary failed the exam  
 'It's that Mari failed the exam that I'm sorry for.'

We abstract away from cases of contrastive focus.

10 For an analysis along these lines, see Lipták (1998), as discussed in Kiss (2002:234-5).

Auxiliary Inversion, a case of T-to-C movement, is not available under factive predicates.<sup>11</sup>

- (18) a. I wondered was he illiterate. [IE]  
 b. I wonder what is he like at all.  
 c. \*I found out how did they get into the building.

The examples in (18) show that T-to-C movement is possible under *wonder* and *ask* type predicates, but ruled out under factive predicates.

Corresponding to the instances of embedded T-to-C in (18) we find instances of adjunction of adverbials to CP. For the *wonder/ask* class of matrix predicates, the results are either good or only marginally unacceptable in Standard English, as in (19a). For the varieties that allow embedded T-to-C, the corresponding examples are completely grammatical, as in (19b).<sup>12</sup> However, factive predicates, which completely disallow the option of embedded T-to-C, also completely disallow the option of adjunction of an adverbial phrase to their CP-complement (19c).

- (19) a. ?Ask your father [<sub>CP</sub> when he gets home [<sub>CP</sub> if he wants his dinner]]. [SE]  
 b. Ask your father [<sub>CP</sub> when he gets home [<sub>CP</sub> does he want his dinner]]. [IE]  
 c. \*It was amazing [<sub>CP</sub> while they were out [<sub>CP</sub> who had got in to their house. [SE]

The examples in (18) and (19) show that there is a clear pattern between adjunction on the one hand, and Subject Auxiliary Inversion on the other. Under *wonder/ask* predicates, both CP-adjunction and Subject Auxiliary Inversion are allowed, while under factive predicates both CP-adjunction and Subject Auxiliary Inversion are prohibited. Given this pattern, McCloskey (2005), following Chomsky (1986), formulates the Adjunction Prohibition, stated in (20).

- (20) *The Adjunction Prohibition*: Adjunction to a phrase which is s-selected by a lexical (open class) head is ungrammatical.

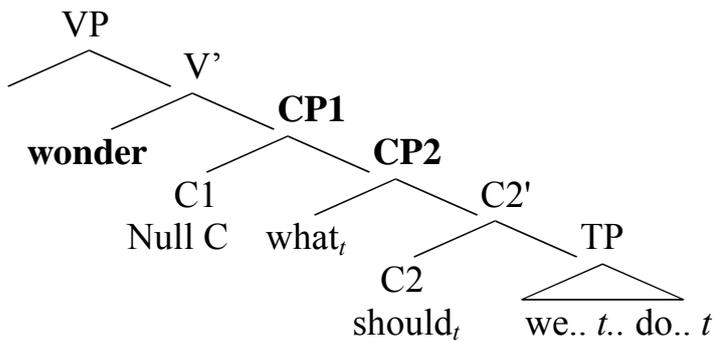
To solve the problem of the apparent cases of adjunction to a lexically selected CP, McCloskey proposes that both adjunction to CP (as in (19a) and (19b)) and Subject Auxiliary Inversion (as in (18a) and (18b)) are possible under

11 Examples (18) through (23) are taken from McCloskey (2005).

12 Note that example (19b) displays both adjunction to CP and Subject Auxiliary Inversion.

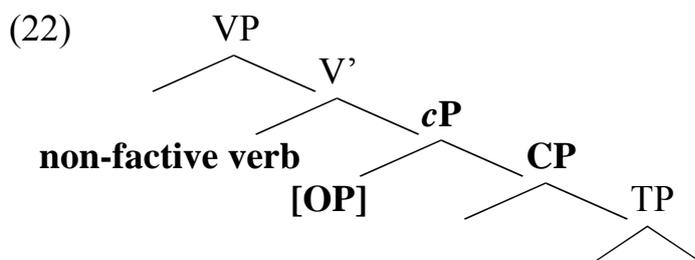
*wonder/ask* type predicates because they select a recursive CP structure. The structure McCloskey (2005:20) provides is in (21). Since CP2 is not lexically selected by the verb *wonder* in (21), it is not subject to the Adjunction Prohibition. This allows Subject Auxiliary Inversion, with *should* raising to C2.

(21) I wonder what should we do. [IE]



Following the Adjunction Prohibition, which allows adjunction to a non-lexically selected phrase, the grammaticality of (19a) and (19b) is now explained. In all these cases, the structure of the *wonder/ask* predicate is as in (21), leaving the lower CP open to adjunction.<sup>13</sup>

The similarity between McCloskey's structure for *wonder/ask* predicates in (21) and our proposed structure for non-factive predicates in (13), repeated below as (22), should be immediately apparent.



In both cases a CP is selected by a functional head (C1 in (26), *c* in (27)), as opposed to a lexical head. Evidence for the structural similarity of *wonder/ask* predicates and non-factive predicates comes from another variety of English. McCloskey (2005:40, citing Henry, 1995) presents data from Belfast English

13 McCloskey argues that both head movement to C and adjunction to CP affect selection. In other words, selection is context sensitive. In the case where a lexical head (the verb in the cases we have been looking at) directly selects a CP, adjunction to that CP or head movement of a lower verb to the head of that CP will change its nature, so the selecting verb will not recognize the CP and selection will fail. For details see McCloskey (2005).

(BE), where Subject Auxiliary Inversion takes place in the complement of a non-factive triggered by *wh*-movement (23).

- (23) a. They wouldn't say which candidate they thought [BE]  
       [<sub>CP</sub> should we hire].  
       b. I'm not sure which one I think [<sub>CP</sub> should we buy].

Here we see Subject Auxiliary Inversion taking place under the non-factive predicate *think*, just as we have seen it under *wonder/ask* predicates in the IE examples in (18a) and (18b). We take McCloskey's data as more evidence that there is extra structure associated with non-factive constructions.

### 3.3. De Cuba (2006a): Factive Islands

Given the discussion in Sections 3.1 and 3.2, we assume the basic structures for non-factive and factive clausal complementation given in (24). Following the Adjunction Prohibition in (20), only in the case where there is a *cP* buffer between VP and CP, as in (24a), can we get adjunction.

- (24) a. [<sub>VP</sub> believe [<sub>cP</sub> [<sub>CP</sub> ... ]]]  
       b. [<sub>VP</sub> regret [<sub>CP</sub> ... ]]

This proposed structural difference is matched by a difference in extraction possibilities from non-factive versus factive complements. While argument extraction is fine out of both non-factives (25a) and factives (26a), adjunct extraction is only possible from non-factives (25b), and not factives (26b).

- (25) non-factive constructions  
       a. What did John believe [<sub>cP</sub> [<sub>CP</sub> that Mary ate *t* ]]? (arg)  
       b. Why did John believe [<sub>cP</sub> [<sub>CP</sub> that Mary ate the apple *t* ]]? (adj)
- (26) factive constructions  
       a. What did John regret [<sub>CP</sub> that Mary ate *t* ]? (arg)  
       b. \*Why did John regret [<sub>CP</sub> that Mary ate the apple *t* ]? (adj)

De Cuba (2006a) claims that argument movement, as in (25a) and (26a), proceeds through Spec-CP (as is standardly assumed). However, he proposes that adjunct movement, as in (25b) and ungrammatical (26b), proceeds through CP Adjunction, not Spec-CP.

- (27) Argument movement – Through Spec-CP  
 Adjunct movement – Through CP Adjunction

The proposal in (27), combined with the Adjunction Prohibition in (20), provides a solution to the Factive Island problem. *Why*-extraction in (26b) is ruled out by the Adjunction Prohibition. No adjunction to CP is allowed in (26b), so the *wh*-adjunct is not able to reach the edge of the phase. In the non-factive case in (25b), a functional head (*c*) selects CP, so adjunction to CP is available, giving an escape hatch to the adjunct.<sup>14</sup>

The analysis of Factive Islands transfers smoothly to the Serbian facts. The basic structure in (24) translates directly into Serbian in (28).

- (28) a. [VP *tvrdiš* [<sub>cP</sub> [<sub>CP</sub> ...]]] [SSC]  
 b. [VP *znaš* [<sub>CP</sub> ...]]

We see the explanation for the extraction asymmetry when we apply the structures in (28) to the sentences in (29).

- (29) Restriction #2: Factive Islands [SSC]  
 a. *Zašto tvrdiš* [<sub>cP</sub> [<sub>CP</sub> *t<sub>zašto</sub>* [<sub>CP</sub> *da si Nenadu dao knjigu*]]]?  
 why **claim-2sg** that AUX to-Nenad given book  
 ‘Why do you claim that you gave a book to Nenad?’  
 b. \**Zašto znaš* [<sub>\*cP</sub> *t<sub>zašto</sub>* [<sub>CP</sub> *da si Nenadu dao knjigu*]]]?  
 why **know-2sg** that AUX to-Nenad given book  
 ‘Why do you know that you gave a book to Nenad?’

Adjunct extraction in (29b) is ruled out because CP is lexically selected by *znaš* ‘know’, ruling out adjunction to CP and leaving the adjunct with no escape hatch (*cP* cannot be selected in (29b), indicated by ‘\*’). Adjunct extraction in (29a) is fine, given that *tvrdiš* ‘claim’ does not lexically select CP, making adjunction to CP possible, allowing the adjunct *zašto* to reach the edge of the phase and then move out. We can see that the same restriction holds for different adjuncts and other factive and non-factive verbs in SSC.

- (30) a. *Kada misliš* [<sub>CP</sub> *t<sub>kada</sub>* [<sub>CP</sub> *da si Nenadu dao knjigu*]]]?  
 when **think-2sg** that AUX to-Nenad given book  
 ‘When do you think that you gave a book to Nenad?’

14 We assume that *cP* is an extension of the CP edge, so the Spec and head of CP remain at the edge of the phase, and thus remain active for further syntactic derivation. For details see de Cuba (forthcoming).

- b. \**Kada shvataš* [<sub>CP</sub> \**t*<sub>kada</sub> [<sub>CP</sub> *da si Nenadu dao knjigu*]]?  
 when **realize**-2sg that AUX to-Nenad given book  
 ‘When do you realize that you gave a book to Nenad?’
- (31) a. *Gde pretpostavljaš* [<sub>CP</sub> *t*<sub>gde</sub> [<sub>CP</sub> *da je Marko otišao*]]?  
 where **suppose**-2sg that AUX Marko left  
 ‘Where do you suppose that Marko left?’
- b. \**Gde saznaješ* [<sub>CP</sub> \**t*<sub>gde</sub> [<sub>CP</sub> *da je Marko otišao*]] ?  
 where **find out**-2sg that AUX Marko left  
 ‘Where do you find out that Marko left?’

We now turn to the first restriction on adjunct extraction from the introduction, the restriction on adjunct ordering in long-distance *wh*-movement.

#### 4. Restriction #1: Adjunct-ordering in long-distance multiple *wh*-mvt

While *wh*-adjunct extraction is possible from non-factive complements in Serbian, ordering restrictions exist, in contrast to the free *wh*-phrase ordering in short-distance multiple *wh*-movement shown in (1). As was shown in (2), repeated here as (32), a long-distance-extracted *wh*-adjunct must appear to the left of a *wh*-argument. Further examples are given in (33) and (34).<sup>15</sup>

- (32) Restriction #1: Adjuncts Must Appear to the Left of Arguments
- a. *Zašto koga tvrdiš* [*da je Marko istukao t t*] ? [SSC]  
 why whom claim-2sg that AUX Marko beaten  
 ‘Why do you claim that Marko has beaten whom?’
- b. \**Koga zašto tvrdiš* [*da je Marko istukao t t*] ?
- (33) a. *Kada koga misliš* [*da je Marko istukao t t*] ? [SSC]  
 when whom think-2sg that AUX Marko beaten  
 ‘When do you think that Marko has beaten whom?’
- b. \**Koga kada misliš* [*da je Marko istukao t t*] ?

15 Our informants either found both examples like (32a&b) ungrammatical (4 out of 9), or they accepted (32a) with the *wh*-adjunct preceding *wh*-argument and rejected (32b) with *wh*-argument preceding *wh*-adjunct (5 out of 9). In the variety of Serbo-Croatian reported by Bošković (1997a:6), the opposite judgments hold. In addition, Nadira Aljović (p.c.) reports that in her variety, long-distance argument movement and long distance adjunct movement, while independently available, are incompatible in the same sentence. For her, (32a) and (32b) are both out, as in both cases an argument and an adjunct move long-distance in the same sentence. At the moment we have no explanation for this fact. We unfortunately must restrict ourselves here to a discussion of the Novi Sad variety, and again leave important microvariation work to the future.

- (34) a. *Gdje ste ko tvrdili [da je zaspao?]* [SSC]  
 where are who claimed that AUX fallen-asleep  
 ‘Who did you claim fell asleep where?’  
 b. \**Ko ste gdje tvrdili [da je zaspao?]*

Following the analysis laid out in this paper, CP-Adjunction is possible in embedded clauses only when *cP* is present between V & CP (due to the Adjunction Prohibition). If the *wh*-phrases must move through the CP-field to escape to a higher clause, then one would expect a *wh*-adjunct adjoined to CP to appear to the left of a *wh*-argument in Spec-CP. So, the order in (35) is predicted.<sup>16</sup> This prediction is borne out in (32) through (34). The structure of (32) is given in (36).

(35) *wh*-adj > *wh*-arg

- (36) [<sub>CPadjoined</sub> *Zašto* [<sub>SpecCP</sub> *koga* [<sub>VP</sub> *tvrdiš* [<sub>CP</sub> [<sub>CPadjoined</sub> *t* [<sub>SpecCP</sub> *t* [<sub>C</sub> *da* ]  
                   why                  whom claim-2sg                  <sub>t</sub><sub>why</sub>                  <sub>t</sub><sub>whom</sub> that  
*je Marko istukao ]]]]]]?  
 AUX Marko beaten*

We see that the adjunct *zašto* ‘why’ is adjoined to the embedded CP, and is then able to escape and move to the matrix CP. The argument *koga* ‘whom’ moves through the Spec of the embedded CP on its way to the matrix Spec of CP. In both cases, the adjunct is in a higher position than the argument.

The ‘adjunct on top’ pattern remains consistent if we add another *wh*-arg for long-distance extraction. Only (37a) and (37b), with the adjunct in the leftmost position, are grammatical.

- (37) a. *Zašto ko koga tvrdiš [da je istukao]?* [SSC]  
 why who whom claim-2sg that AUX beaten  
 ‘Who did you claim beat whom, and why?’

16 There is another restriction on adjuncts that has come to our attention. Two adjuncts do not seem to be able to be extracted out of an embedded clause.

- (i) \**Zašto kada tvrdiš da je Marko istukao Milana t t?*  
 Why when claim-2<sup>nd</sup> that AUX Marko beaten Milan  
 (ii) \**Kada zašto tvrdiš da je Marko istukao Milana t t?*  
 When why claim-2<sup>nd</sup> that AUX Marko beaten Milan

However, this is also the case in short-distance *wh*-movement, as (iii) is also bad.

- (iii) \**Gde kada idemo na more?*  
 where when go-3p.pl. on seaside

Conjoining the adjuncts with ‘and’ fixes examples (i) through (iii). At present we have no explanation for this restriction on multiple adjunct extraction.



Adjunction to a CP will still put the *wh*-adjunct in the highest position, above any/all Spec positions. Examples (37c) through (37f) are therefore ruled out.

## 5. Conclusion

In this paper we examined long-distance *wh*-movement in the Serbian variety of Serbo-Croatian (SSC) and showed that unlike in short-distance *wh*-movement, there are restrictions on adjunct movement and placement. First, both *wh*-arguments and *wh*-adjuncts can be extracted from non-factive clausal complements, but only *wh*-arguments can be extracted from under factives. We follow the analysis of Factive Islands in de Cuba (2006a), which accounts for the restriction on *wh*-adjunct extraction from factive clausal complements in SSC. Second, we showed that there are restrictions on *wh*-adjunct ordering in long-distance vs. short-distance multiple *wh*-movement in SSC. In contrast to the free *wh*-phrase ordering in short-distance multiple *wh*-movement, *wh*-adjuncts must appear to the left of *wh*-arguments in long-distance multiple *wh*-movement. Following the analysis laid out in this paper, CP-adjunction is only possible in embedded clauses when *cP* is present between V & CP (only under non-factive predicates). We argue that *wh*-phrases must move through the CP-field to escape to a higher clause, and thus correctly predict that a *wh*-adjunct adjoined to CP should appear to the left of a *wh*-argument in Spec-CP.

Our analysis captures these restrictions on *wh*-adjunct movement without losing the benefits of previous analyses of short-distance *wh*-movement. Bošković (1997a, 1998, 2003) and Stjepanović (1998, 2003) argue that in SC short-distance multiple *wh*-movement, movement is adjunction to IP as opposed to movement to CP. Their claim that this movement is not driven by a [+*wh*] feature but by focus is compatible with our claims about long-distance multiple *wh*-movement. However, more work on microvariation across varieties of Serbo-Croatian is needed in order to get a fuller picture of *wh*-adjunct extraction possibilities.

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*Bartłomiej Czaplicki*

## **Decomposition of Nasal Vowels in Polish\***

### **1. Introduction**

In this paper I discuss evidence from non-normative innovating speech and show that it unequivocally supports the representation of Polish “nasal vowels” (here and below we use this term for compactness) as an oral vowel and a nasal consonant, //VN//. The alternative view, that is underlying nasal vowels // $\tilde{v}$ //, is rejected. “Nasal vowels” is a traditional term commonly used to describe the realization of the spelled *a* and *e*. Although historically mostly accurate, the term no longer reflects the phonetic facts. In place of the expected, judging by the name, [ɔ̃] and [ɛ̃] for *a* and *e* respectively, we find most commonly either [ɔN] and [ɛN] (N stands for a nasal consonant with its place of articulation converging with that of the following non-continuant) or [ɔ̃w̃] and [ɛ̃w̃] in clearly specified contexts. Pure nasal vowels [ɔ̃] and [ɛ̃] in which nasalization endures throughout the vowel are not used in Polish. Buttressing the main thesis of this paper are the discernible tendencies that bear witness to phonetic denasalization in, at least, some environments. This paper argues that nasal vowels / $\tilde{ɔ}$ / and / $\tilde{ɛ}$ / are not only absent from phonetics, more importantly, their assumption in the underlying representation for the spelled *a* and *e* cannot be maintained in a phonological analysis. That the representation //VN// for *a* and *e* is correct, is supported by evidence from both prescriptive and non-normative usage. Additionally, in the course of this analysis, it is claimed that some nasal vowels are in fact sequences of a fleeting vowel (a vowel alternating with zero, a yer) and a nasal consonant.

The analysis is carried out in the framework of lexical phonology (Kiparsky 1982, Rubach 1984) with the use of autosegmental theory and is structured as follows. Section 2 presents the realizations and states the contexts of allophonic variation. We also set the scene for the subsequent analysis by discussing processes which have a direct impact on “nasal vowels”. In subsequent sections, we deal with the standard (section 3) and non-normative (section 4) paradigms of *wziąć* ‘take’. The // $\tilde{v}$ // analysis collapses in both cases. The //VN// approach is supported in section 5, where we discuss several innovations. Section 6 dismisses arguments commonly employed by the proponents of underlying nasal vowels. The most important conclusions are recapitulated in section 7.

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\* I am grateful to the anonymous reviewers for their valuable comments and criticism, that led to a considerable improvement of both the content and the presentation of this study.

## 2. Background facts

What deserves explanation at the outset is the term “nasal vowel” in Polish. Although historically motivated, it seems synchronically inadequate, as the realizations indicated in the spelling by *ą* and *ę* are never singleton nasal vowels.

- (1) a. /VN/: *rąbać* /rɔmbatɕ/ ‘hew’, *rządy* /ʒɔndɨ/ ‘governments’,  
*pięć* /pjɛntɕ/ ‘five’, *ręka* /rɛŋka/ ‘hand’  
 b. /ĩĩ/: *wąs* /vɔĩs/ ‘moustache’, *kęs* /kɛĩs/ ‘bite’  
 c. /ĩĩ/: *idą* /idɔĩ/ ‘they go’, *idę* /idɛĩ/ ‘I go’

There are two realizations of “nasal vowels” *ą* and *ę*, in both cases they show up as two objects: an oral vowel followed by a nasal consonant [VN] or a nasalized vowel accompanied by a nasalized glide [ĩĩ]. The former occurs before non-continuants, that is stops and affricates, (1a). The place of articulation of the nasal agrees with that of the following non-continuant. The latter realization arises in two disparate contexts: before fricatives, (1b), and word-finally, (1c).

It is useful to review the underlying representation of *ą* and *ę* in the literature. Bethin (1992) and Stieber (1958), among others, advocate a singleton object, where nasalization is synchronized with the vowel – //ĩ// and //ɛ//. Others represent “nasal vowels” as two objects. Biedrzycki (1963) and Jassem (1973) assume an oral vowel and a nasalized glide (/ɔĩ/ and /ɛĩ/), much as in the phonetic forms of *wąs* and *kęs* in (1b). Rubach (1984) and Gussmann (1980), on the other hand, favor an oral vowel and a nasal consonant as the underlying representation for *ą* and *ę* – //ɔN// and //ɛN//.<sup>1</sup> It is the singleton-object representation and the latter of the two-object representations that are evaluated in this paper, as it falls out from the discussion that if the singleton-object representation is found to be deficient the analysis advocating //ɔĩ// and //ɛĩ// is equally implausible. Henceforth, the term nasal vowel analysis //ĩ// signifies an analysis assuming singleton nasal vowels in the underlying representation.

In this approach, a discussion of “nasal vowels” would not be complete without at least a cursory look at fleeting vowels, that is vowels alternating with zero, traditionally termed yers. The words *pies* ‘dog’ and *sen* ‘dream’ are used to illustrate two types of yers.

- (2) a. *pies* [pjɛs] nom.sg. vs. *ps+a* [psa] gen.sg.  
 b. *sen* [sɛn] nom.sg. vs. *sn+u* [snu] gen.sg.

1 The nasal consonant is preferably unspecified for place, as it assimilates to the following consonant.

Both items in (2) show yers, vowel/zero alternations. In (2a), we can see a yer that causes surface palatalization effects on the preceding consonant.<sup>2</sup> Observe, however, that palatalization disappears together with the yer in the gen.sg. form. In contrast, the yer in (2b) does not trigger palatalization. The fleeting vowels exemplified in (2a) are termed front, while those in (2b) back yers.

After Gussmann (1980), Rubach (1984) and (1986), we assume that the zero endings of nom.sg. masc., illustrated in (2), and gen.pl. fem. and neut. (e.g. *żab+a* – *żab* ‘frog’) are in fact yer endings. With this provision in mind, it is possible to generalize that a yer surfaces before another yer and is deleted when no yer follows, that is before a non-yer vowel or word-finally. Intervening consonants are ignored.

The presentation of the rule system is cast in autosegmental theory. We make use of three tiers of representation. Briefly, the melodic tier contains the featural representation of each segment, the skeletal tier provides timing slots - X-slots, finally, the syllabic tier specifies where a segment belongs in the syllable structure.<sup>3</sup> Following Rubach (1986), I assume that yers are distinguished from other vowels in that they lack an X-slot in the underlying representation, that is they are floating feature matrices. Polish has near minimal pairs that contrast yers with non-yer vowels. The words for ‘cutter’ and ‘scooter’ are used as an illustration.

- (3) a. *kuter* nom.sg. vs. *kutra* gen.sg.  
 b. *skuter* nom.sg. vs. *skutera* gen.sg.

The vowel/zero alternation in (3a) is an indication of a yer. A non-fleeting vowel is visible in (3b).<sup>4</sup> Representations of the nom.sg. forms of the two words are given below.

- (4) a.    x x x x    b.    x x x x x x  
           | | | |        | | | | | |  
           k u t ε r + i    s k u t ε r + i

The distinction between front and back yers is present on the melodic tier, as shown in the nom.sg. forms for ‘dog’ and ‘dream’.<sup>5</sup>

2 In this case, a separate palatal segment /j/ surfaces.

3 This analysis cast in moraic theory leads to similar conclusions.

4 In this paper, yers are synchronic objects showing vowel/zero alternations. That they cannot be regarded as historical objects is shown by borrowings that never had yers (*sweter* ‘sweater’), but show fleeting vowels (*swetr+a* gen.sg.).

5 In fact, the yer in the root of *kuter* is probably the [+back] /ɤ/, as it is non-palatalizing; see also below. Following the tradition, the inflectional yers are represented as high vowels.

- (5) a.  $\begin{array}{c} x \quad x \\ | \quad | \\ p \quad \varepsilon \quad s + \dot{i} \end{array}$       b.  $\begin{array}{c} x \quad x \\ | \quad | \\ s \quad \varkappa \quad n + \dot{i} \end{array}$

Both root yers in (5) are mid and unrounded, but / $\varepsilon$ / in (5a) is [-back] and / $\varkappa$ / in (5b) [+back]. The latter, non-palatalizing vowel, although never realized phonetically, is motivated outside yers in Polish (Rubach 1984). In terms of rules, the vowel/zero alternation is *pies/psa* and *sen/snu* is handled by Lower (Rubach 1986: 265).

- (6) Lower       $\textcircled{V} \rightarrow \begin{array}{c} N \\ | \\ X / \_ C \textcircled{V} \\ | \\ [-hi] \end{array}$

Here and below, a circled segment stands for a segment without an X-slot. Lower, (6), accomplishes two tasks: it assigns a fleeting vowel a syllabic slot (yer vocalization) and lowers high vowels to mid vowels. Notice that the latter operation of Lower is vacuous in the words in (5). It becomes crucial when Derived Imperfective (DI, henceforth) forms for ‘lock’ are considered.<sup>6</sup>

- (7) a. *zamek* [zamek] nom.sg.  
 b. *zamk+n+ę* [zamkněw̃] 1st p.sg. non-past  
 c. *zamyk+a+ć* [zamiakatç] inf., *zamyk+aj+ą* [zamičajõw̃] 3rd p.pl.

The DI suffix in (7c) triggers the vocalization of the preceding yer. Observe, however, that in this case we are dealing with a three-way alternation  $\varepsilon/\text{ɔ}/\dot{i}$ . We follow Rubach (1986) in assuming that the underlying yer in *zamek* and its derivatives is a high vowel.

- (8)  $\begin{array}{c} x \quad x \quad x \quad x \\ | \quad | \quad | \quad | \\ z \quad a \quad m \quad \dot{i} \quad k + \dot{i} \end{array}$

Lower is now well-motivated in its formulation in (6), since the yer in *zamek* must lower, as well as vocalize.<sup>7</sup> To summarize, the output of Lower are mid

6 A reviewer points out that the /j/ in the suffix *+aj* lacks grounding. It could either come from the imperative ending or be epenthetic. In this view, certain class distinctions in verbs would be difficult to maintain. Specifically, in the verbs *czyt+a+ć* ‘read’ and *pis+a+ć* ‘write’ the dissimilar 3rd p.pl. forms *czyt+aj+ą* and *pisz+ą* would be problematic to account for.

7 It is also possible to represent *all* yers as high vowels, including the ones with a two-way alternation  $\varepsilon/\text{ɔ}$  in (5). This option is objectionable, as it is unnecessarily abstract.

vowels: [-back] /ɛ/ and [+back] /ɤ/. As /ɤ/ never surfaces, it must undergo a further change (Rubach 1986: 256).

$$(9) \quad \text{Vowel Spell-out} \quad \gamma \rightarrow \begin{cases} o / \_ \text{CC} \{ \# \\ e \end{cases} \textcircled{V} \#$$

The operation of Vowel Spell-out, as schematically presented in (9), accounts for the alternations in *żąć* ‘reap’ below. Here and below, yers are capitalizedized.

- (10) a. *żni+e* // *ʒɲn+ɛ*// → /ʒɲɛ/ 3rd p.sg. non-past  
 b. *żą+ł* // *ʒɲn+ɫ+ɪ*// → /ʒɔw/ 3rd p.sg. past masc.  
 c. *żę+ł+a* // *ʒɲn+ɫ+a*// → /ʒɛwa/ 3rd p.sg. past fem.

The non-past form in (10a) shows Yer Deletion, a context-free postcyclic rule, as no other yer follows. The past masc. form in (10b) meets the first extension of Vowel Spell-out, (9), while the past fem. form in (10c) illustrates the elsewhere case of the rule. In the past forms, there is subsequent deletion of the nasal and the underlying /ɫ/ becomes /w/.

To return to the DI forms in (7c), a rule restricted to the context of the suffix *+aj* is necessary (Rubach 1986: 265).

$$(11) \quad \text{DI Vocalization} \quad \textcircled{V} \rightarrow \begin{array}{c} \text{N} \\ | \\ \text{X} \\ | \\ \text{V} / \_ \text{C aj} \quad ]_{\text{DI}} \end{array}$$

DI Vocalization assigns a syllabic slot to yers before the *+aj* of the DI, as seen in *zamykają* /zamɨk+aj+ɔm/ and *zamykać* /zamɨk+aj+tɕ/.<sup>8</sup>

This rather lengthy introduction will not be complete without a look at prefixes. Rubach and Booij (1990) assert that prefixes in Polish diverge in their behavior with respect to phonological and word formation rules. Although, from the point of view of morphology, they must be processed before certain suffixes, phonology shows evidence that they are the last to be processed in the cyclic component. This is substantiated by the observation that prefixes escape the application of certain word-level rules, such as Vowel Deletion and j-Deletion. Additionally, syllabification fails to proceed across prefix junctures, commonly in violation of sonority sequencing. Suffix junctures, on the other hand, tend to be invisible to syllabification (consult Rubach and Booij 1990 for details).

8 In *zamykać* /zamɨk+aj+tɕ+ɪ/, the /j/ of the suffix is deleted before a consonant.

Yer vocalization provides further evidence for the special status of prefixes among affixes. A number of prefixes show vowel/zero alternations, which is indicative of an underlying yer. Below we look at three of them: *od-/ode-*, *z-/ze* and *roz-/roze-*.

- (12) a. odE+szEd+ł *odszedł* ‘go away’ 3rd p.sg. past masc.  
 odE+szEd+ł+a *odeszła* ‘go away’ 3rd p.sg. past fem.  
 b. zE+klln+aj+ć *sklinać* ‘rebuke’ inf. DI<sup>9</sup>  
 zE+klln+e *zeklnie* ‘rebuke’ 3rd p.sg. non-past  
 c. rozE+dzIr+e+aj+ć *rozdzierać* ‘tear apart’ inf. DI  
 rozE+dzIr+e+ć *rozedrzeć* ‘tear apart’ inf. perf.

Looking at the alternations in (12), it is clear that the vocalization of the yer in the prefix depends on the vocalization of the yer in the stem. Specifically, if the stem yer vocalizes, the yer in the prefix does not, and vice versa. Given the fact that the vocalization of the yer in the stem is, in turn, tied to the presence of a yer (or the DI +aj) in the following suffix, we must conclude that prefixes are processed last in phonology.<sup>10</sup>

### 3. Analysis of the normative paradigm ‘take’

We now look at the paradigm of *wziąć* ‘take’ and consider the traditional normative forms. It is useful to compare it with the paradigm of *zżąć* ‘reap’.

- (13) a. *wz+iq+ć /vzɔɲtɕ/*    *z+żq+ć /zżɔɲtɕ/*    inf.  
 b. *weź+m+ie /vɛzmjɛ/*    *ze+żn+ie /zɛżɲɛ/*    3rd p.sg. non-past  
 c. *wz+iq+ł /vzɔw/*    *z+żq+ł /zżɔw/*    3rd p.sg. past masc.

9 In addition, the obstruent of the prefix devoices before the stem-initial voiceless obstruent.

10 A reviewer points out that vowel/zero alternations are syllable driven. While it is certainly true in many cases, a look at the behavior of yer prefixes before roots with or without yers indicates that this is the wrong path. The case in question can be illustrated by *odgrodzić* odE+grodzić ‘separate’ versus *odegrać* odE+gErać ‘pay back’. The root in *odegrać* shows vowel/zero alternations, *grać/gra/gier* ‘play’/‘game’(nom.sg.)/‘game’(gen.pl.). Under this analysis, the yer in the root triggers the vocalization of the prefix yer, the latter remains unvocalized in *odgrodzić*. Notice that syllable structure cannot be held responsible for the vocalization in *odegrać* and the lack of it in *odgrodzić*, as the resulting stem-initial clusters are identical. Yearley (1995) attempts to apply syllable considerations to similar alternations in Russian, but her analysis of prefixes obscures the facts, rather than explain them.

Under the //VN// analysis, we assume a yer in the roots, as well as in the prefixes in (13). It is far from obvious that *wz-/wez-* is a prefix in *wziąć*. Three facts support its status. First, the prefix functions in words like *ws+pierać/wes+przeć* ‘support’ DI/perf.,<sup>11</sup> *wz+bierać/wez+brać* ‘surge’ DI/perf. Second, the complex morphological structure of *wz+iać* is indicated by historically related words *za+jąć* ‘occupy’, *ob+jąć* ‘hug’, *wy+jąć* ‘take out’, and so forth (Brückner 1970). Additionally, the related words show root-initial /j/ which is deleted in the *wziąć* paradigm. Finally, the vowel/zero alternation conditioned on the vocalization of the subsequent yer in the root in (13a) and (13b) makes *wEz-* parallel to, for instance, *odE-*, see (12). The vowel alternations in the root of *wziąć* closely resemble yer alternations, presented in section 2, both in their nature and in their conditioning. This is sufficient to assume a fleeting vowel in the root. The forms in (13a, c) show the application of Lower, followed by the first extension of Vowel Spell-out.<sup>12</sup> The non-past form in (13b) undergoes Yer Deletion, as the context of Lower is not met.

Although the paradigms of *wziąć* and *zżąć* are largely parallel, what sets them apart are the roots of the non-past forms in (13b) where the yers are deleted and the nasal consonant surfaces. In *zżąć*, it is /n/, while in *wziąć*, we see /m/ instead. This difference must be encoded in the underlying representation: //zE+žĤn+tç+I// versus //vEz+jĤm+tç+I//. Although roots with underlying //...Ĥm...// are not as numerous as those with //...Ĥn...//, they cannot be ignored.

- (14) *Wyżąć* ‘reap’, *wyżnie* 3rd p.sg. non-past  
*Wyżąć* ‘squeeze’, *wyżmie* 3rd p.sg. non-past  
*Wyciąć* ‘cut’, *wytnie* 3rd p.sg. non-past  
*Nadąć* ‘inflate’, *nadmie* 3rd p.sg. non-past; Gussmann (1980)

At this point, we leave the //VN// analysis of nasal vowels to find out whether the analysis assuming underlying singleton nasal vowels, //ṽ//, is able to account for the differences in the paradigms in (13). We begin with the more common *zżąć* and postulate //zE+žĤñ+ć//. Similarly, the representation of *wziąć* is //vEz+jĤñ+ć//. Looking at the forms in (13b), it is evident that the nasal vowel analysis does not handle the data. Specifically, a rule that deals with *zżąć* → *zeżnie*, that is  $\tilde{\text{ñ}} \rightarrow \text{n}$  ( $\rightarrow \text{ɲ}$ ), must also apply in *wziąć* → *weźmie*, but here the expected change is  $\tilde{\text{ñ}} \rightarrow \text{m}$  ( $\rightarrow \text{mj}$ ). As the conditioning is identical, the process cannot be formulated in a satisfactory way. In relation to the word for ‘reap’, even more problematic is the word for ‘squeeze’ in (14). Observe that if nasal vowels are underlying, the two words must have identical representations of the

11 The final obstruent of the prefix is devoiced before the stem-initial voiceless obstruent.

12 The nasal that provides the context for Vowel Spell-out is subsequently deleted in the past form, see (10).

roots //ż̃//. As the context is similar, the rules that would generate [ʒɲ] and [ʒm] are mutually exclusive. The upshot of the analysis of words such as *zżać* – *zeźnie* versus *wziąć* – *weźmie* is that singleton nasal vowels cannot be assumed to underlie these alternations, as the same input //ż̃// would have to generate two diverse outputs [ɲ] (*zeźnie*) and [mj] (*weźmie*) in a parallel context.

Now it makes perfect sense to consider the non-normative paradigm of *wziąć*. It is reasonable to assume that the restructuring that took place in the paradigm is linked to the presence of underlying nasal vowels. To find out whether this claim is warranted, we subject the new paradigm to the nasal vowel analysis and discover that it generates the wrong results. Subsequently, we take up the //VN// analysis to see if it handles the data.

#### 4. Analysis of the non-normative paradigm ‘take’

Let us consider the relevant forms of the modified paradigm, again comparing it with *zżać*.<sup>13</sup>

- (15) a. *wz+ia+ć* /vzɔɲtɕ/    *z+żq+ć* /zʒɔɲtɕ/    inf.  
 b. *weź+n+ie* /veʒɲɛ/    *ze+żn+ie* /zeʒɲɛ/    3rd p.sg. non-past  
 c. *wz+ia+t* /vzɔw/    *z+żq+t* /zʒɔw/    3rd p.sg. past masc.

In accounting for the change in the paradigm of *wziąć*, one might resort to the nasal vowel analysis and claim that, under the pressure from the predominating pattern in *zżać/zeźnie*, the nasal vowel in the underlying representation of *wziąć* is regularly decomposed into a vowel and /n/, as sketched below.

- (16) /ż̃/ → /ɔɲ/ → /ɔɲ/ in *wziąć*  
 /ż̃/ → /ɔɲ/ → /n/ → /ɲ/ in *weźnie*

From this perspective, the marginal alternation in the normative *wziąć* – *weźmie*, (13), is seen as irregular and eventually eliminated from the paradigm of *wziąć* and other parallel words.

On the face of it, the analysis makes perfect sense until we consider the details of the derivations of *wziąć* and *weźnie* on the assumption of underlying nasal vowels. For space considerations, I choose not to present the complete cycles that are involved, still the ordering of some of the above mentioned rules is retained.

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<sup>13</sup> See footnote 12.

(17)	//vEz+jɔ̃+tɕ//	<i>wziąć</i>
	vEz+jɔ̃n+tɕ	Nasal Vowel Decomposition
	–	Lower (6)
	vz+jɔ̃n+tɕ	Yer Deletion
	[vʐɔ̃ntɕ]	

In (17), Nasal Vowel Decomposition applies in the context of following non-continuants. As the root contains no yer, the yer of the prefix fails to vocalize and is eventually deleted. The remaining assimilatory rules take effect to derive the actual phonetic form. A parallel account of *weźnie* requires an extension of the rule of Nasal Vowel Decomposition to include the context of following vowels.

(18)	//vEz+jɔ̃+ɛ//	<i>weźnie</i>
	vEz+jɔ̃n+ɛ	Nasal Vowel Decomposition
	–	Lower (6)
	vz+jɔ̃n+ɛ	Yer Deletion
	*[vʐɔ̃nɛ]	

As in the derivation of *wziąć*, once the nasal vowel is decomposed, Lower fails to apply to the yer in the prefix, but in this case the application of Yer Deletion (and subsequent rules) yields the wrong output. A very costly improvement would be an assertion that certain nasal vowels decompose into a *yer* and a nasal consonant. Notice, however, that in view of their highly restricted occurrence (verbal stems), such underlying *nasal yers* invite an objection of being an artifact of the analysis. In another attempt to salvage the nasal vowel analysis, we resort to Vowel Deletion, which effects the deletion of one vowel immediately before another. The cyclic status of the rule makes Vowel Deletion applicable in derived environment (Rubach 1984: 97).

(19) Vowel Deletion [-cons] → ∅ / \_\_\_\_ [-cons]

The rule has common application in the verbal system, as evidenced by *wisieć* /vis+ɛ+tɕ/ [viɕetɕ] ‘hang’, *wisi* /vis+ɛ+i/ [viɕi] ‘hang’ (3rd p.sg.), *styszeć* /słiś+ɛ+tɕ/<sup>14</sup> [swiʂetɕ] ‘hear’, *styszq* /słiś+ɛ+ɔ̃/ [swiʂɔ̃w] ‘hear’ (3rd p.pl.). Stem vowels (oral or nasal) are dropped before a vocalic desinence. Thus, the application of Vowel Deletion in *weźnie* is well-motivated.

14 The input forms disregard the alternation in *sluch* ‘hearing’ – *styszeć* ‘hear’.

- (20) //vEz+j $\tilde{\sigma}$ +ε//      *weźnie*  
       vEz+j+ε              Vowel Deletion (19)  
       –                        Lower (6)  
       vz+j+ε                Yer Deletion  
       \*[v $\zeta$ ε]

Evidently, the extension of Vowel Deletion to nasal vowels is the wrong path, as not only the yer of the prefix fails to vocalize. To make things worse, no trace of nasality is left, which rules out a nasal consonant in the root. As a result, the output is not nearly close to the actual realization of the word. The analysis assuming underlying nasal vowels handles neither the prescriptive *wziąć* – *wezmę* nor the innovating *wziąć* – *weznę* (and others) and is abandoned.

We return to the analysis assuming //VN// for *q* and *ε*. Although, to draw a parallel with the analysis above, the non-normative paradigm of *wziąć* is considered, the derivations of the normative forms do not diverge in a significant way. We begin by looking at the underlying representations of *wziąć* and *weźnie*.

- |  |   |
|--|---|
| $\begin{array}{ccccc} x & x & x & x & x \\   &   &   &   &   \\ //v & \varepsilon & z & + & j & \dot{\imath} & n & + & t\zeta & + & i// \end{array}$ | $\begin{array}{ccccc} x & x & x & x & x \\   &   &   &   &   \\ //v & \varepsilon & z & + & j & \dot{\imath} & n & + & \varepsilon// \end{array}$ |
|--|---|

Before we proceed to the derivations of *wziąć* and *weźnie*, it is necessary to spell out the remaining rules. As the rules are not central for the present purposes, they only deserve informal formulations. The first of them is Coronal Palatalization, which applies to coronals before front vowels and /j/. The glide /j/ is deleted after coronals via j-Deletion. Finally, Nasal Assimilation states that a nasal assumes the place of the following obstruent non-continuant. In keeping with the rudiments of lexical phonology, first, cyclic rules apply. To save space, we do not show subsequent cycles. Roughly speaking, cyclic rules operate at morpheme boundaries (actually, the definition of the context – derived environment – is more complicated but superfluous for our purposes). At the end of the derivations, postcyclic rules apply.

- (22)
- |        |   |                        |
|--------|---|------------------------|
| Cyclic | //vEz+j $\dot{\imath}$ n+t $\zeta$ +I// |                        |
|        | j $\dot{\imath}$ n+t $\zeta$ +I         |                        |
|        | j $\gamma$ n+t $\zeta$ +I               | Lower (6)              |
| Prefix | vEz+j $\gamma$ n+t $\zeta$ +I           |                        |
|        | –                                       | Lower (6)              |
|        | vE $\zeta$ +j $\gamma$ n+t $\zeta$ +I   | Coronal Palatalization |
|        | vE $\zeta$ + $\gamma$ n+t $\zeta$ +I    | j-Deletion             |

Postcyclic	vEz+ɣn+tɕ+I	
	vEz+ɔn+tɕ+I	Vowel Spell-out (9)
	vɤ+ɔn+tɕ	Yer Deletion
	vɤ+ɔŋ+tɕ	Nasal Assimilation

In the cyclic component, the yer of the root vocalizes via Lower. The rule does not apply to the yer in the prefix in the subsequent cycle, as the context of the following yer does not arise. The postcyclic component witnesses the application of Vowel Spell-out, resulting in /ɔ/. Yer Deletion eliminates unvocalized yers and the nasal adjusts its place.

The derivation of the 3rd p.sg. non-past *weźnie* diverges from the previous derivation in one significant point.

(23)	//vEz+jɪn+ɛ//	
Cyclic	jɪn+ɛ	
	–	Lower (6)
Prefix	vEz+jɪn+ɛ	
	vɛz+jɪn+ɛ	Lower (6)
	vɛɤ+jɪn+ɛ#	Coronal Palatalization
	vɛɤ+ɪn+ɛ	j-Deletion
Postcyclic	vɛɤ+ɪn+ɛ	
	–	Vowel Spell-out (9)
	vɛɤ+ɪn+ɛ	Yer Deletion

In the absence of a following yer, the yer in the root fails to vocalize, unlike the yer in the prefix which surfaces as [ɛ]. Notice that the normative paradigm *wziąć/weźmie* in (14) poses no problems for the //VN// analysis. With the substitution of /m/ for /n/ in the root, the derivations are parallel. Equally unproblematic are the words in (14). *Wyżąć/wyżynać* is represented with the root //żɪn//, while in *wyżąć/wyżymać* it is //żɪm//. Thus, their derivations are minimally different and lead to different outputs. On a more general note, we conclude that the restructuring in the *wziąć* paradigm resulting in the elimination of /m/ from the root is not tied to underlying nasal vowels.

## 5. More evidence in favor of the //VN// analysis

In a further attempt to undermine the status of nasal vowels in contemporary Polish phonology, we turn to the innovating forms of the DI.<sup>15</sup> The vowel alternation in (24) is fully regular.

(24)	base	DI
	rob <u>ić</u> ‘do’	(wy)rab <u>iać</u>
	chl <u>o</u> dzić ‘cool’	(wy)chl <u>o</u> dz <u>ać</u>
	ko <u>ń</u> czyć ‘finish’	(za)k <u>o</u> ńc <u>ać</u>
	chl <u>o</u> nać ‘absorb’	(po)chl <u>o</u> ń <u>a</u> ć
	kro <u>ć</u> ‘cut’	(wy)kro <u>a</u> ć

The forms in (24) exhibit the *o/a* alternation. It is formalized as a process changing [ɔ] into [a] before the +*aj* of the DI.<sup>16</sup>

(25) ɔ# → a / \_\_\_\_ C<sub>0</sub> aj ]<sub>DI</sub>

Fluctuations are commonplace when “nasal vowel” roots are subjected to the DI formation.

(26)	base	DI	presc. / innov.
a.	wyłącz <u>yc</u> [ɔn] ‘turn off’	wyłącz <u>ać</u> [ɔn] / [an]	
	wymądrz <u>yc</u> [ɔn] ‘play clever’	wymądrz <u>ać</u> [ɔn] / [an]	
	wtrą <u>ć</u> [ɔn] ‘butt in’	wtrą <u>ać</u> [ɔn] / [an]	
b.	zak <u>ą</u> sić [ɔ̃w̃] ‘snack’	zak <u>a</u> sz <u>ać</u> [ɔ̃w̃] / [ãw̃]	
	pogr <u>ą</u> żyć [ɔ̃w̃] ‘sink’	pogr <u>a</u> ż <u>ać</u> [ɔ̃w̃] / [ãw̃]	

The vowels of the DI indicated in the spelling by *a*, realized as [ɔn] in (26a) and those with a nasalized glide in (26b) equally resist rule (25) in prescriptive speech. Innovating speakers, on the other hand, do not differentiate between the roots in (24) and (26), and equally apply rule (25). It is worthy of notice that the innovating DI forms in (26) are increasingly commonplace in the language of even the most careful speakers. Turning to the phonological account, it seems plausible to postulate that the operation of rule (25) in the DI’s in (26) is conditioned on the input vowel /ɔ/, not a nasal vowel /ɔ̃/. Only then the process

15 Concerning the innovations in “nasal vowels” in this paper, I know of no study to date that presents statistical data. Although Poles generally confirm these findings, the matter awaits further research.

16 In *wyrabiać*, the /j/ is deleted before a consonant, compare *wyrabiaj* (imper.) and *wyrabiają* 3rd p.pl.

in (25) uniformly applies in the words in (24) and (26). Although the case in (26) compromises the status of nasal vowels, it is not yet sufficient to eliminate them from the underlying representation. An option remains which involves underlying nasal vowels decomposing into /ɔn/ prior to the application of (25). We need to look at more data.

The following piece of evidence indicative of the weakening status of nasal vowels refers to their behavior at word edges.

(27)	a.	1st p.sg.			
		robi+ę ‘do’	[ɛ]	[ɛm]	
		id+ę ‘go’	[ɛ]	[ɛm]	
		nosz+ę ‘carry’	[ɛ]	[ɛm] <sup>17</sup>	
	b.	3rd p.pl.			
		robi+a ‘do’	[ɔ̃w̃]	[ɔ]	[ɔm]
		id+a ‘go’	[ɔ̃w̃]	[ɔ]	[ɔm]
		nosz+a ‘carry’	[ɔ̃w̃]	[ɔ]	[ɔm]

The front  $\epsilon$  and the back  $a$  show divergent tendencies word-finally. The extent to which they exhibit denasalization/decomposition is different. The front vowel (27a) is virtually never nasal on the surface (hypercorrect or emphatic pronunciation aside). Most frequently, it is denasalized to [ɛ] or surfaces as two objects, an oral vowel followed by /m/ – [ɛm]. In the case of the back nasal vowel, phonetic nasality is commonplace and standard, as evidenced by [ɔ̃w̃] in (27b). Unquestionably though, the denasalized [ɔ] and the two-object [ɔm] occur in colloquial or regional speech. Although nasalization of word-final nasal vowels is far from obsolete in contemporary standard Polish pronunciation, the tendencies towards denasalization and decomposition of  $a$  and  $\epsilon$  are on the rise.

There is a limited group of verbs ending in /ɛm/ in 1st p.sg. non-past, historically unrelated to nasal vowels, whose development in non-normative speech would be inexplicable without reference to nasal vowels.

(28)		standard	non-standard
	rozum <u>i</u> + <u>e</u> + <u>m</u> ‘understand’	[ɛm]	[ɛ]
	umi+ <u>e</u> + <u>m</u> ‘I know’	[ɛm]	[ɛ]

The “incorrect” variant [ɛ] is characterized by the loss of the nasal labial consonant which is present in the “correct” form [ɛm]. It makes perfect sense to

17 The latter realization may be illustrated by former Polish president Lech Wałęsa’s famous rendition of the phrase referring to his decision to run for president *Nie chcę [ɛm], ale muszę [ɛm]* ‘I don’t want to but have to’.

treat the words in (28) on a par with the words showing remnants of nasal vowels in (27). The deletion of the final nasal segment may be seen as analogous to the denasalization in (27). The implication is that the 1st p.sg. ending in (27a) underwent restructuring in the underlying representation  $//\tilde{\epsilon}// \rightarrow //+\epsilon m//$ , thus making it identical to the  $//+\epsilon m//$  in (28). Consequently, both endings are subject to denasalization  $//+\epsilon m// \rightarrow [\epsilon]$ . Supporting this restructuring is the sporadic spelling *rozumie* and *umie* for the words in (28). We conclude that the two-object interpretation of  $\epsilon$  helps explain these two seemingly disparate tendencies in (27) and (28). What is more, the increasingly high frequency of the discussed non-normative forms in (26) and (27) corroborates  $//VN//$  standing for  $\epsilon$  and  $q$  in the underlying representation.

Further support that nasal vowels do not underlie personal endings comes from the class of *aj*-stem verbs (Rubach 1984: 47).

(29)	infinitive		1st p.sg. non-past		gloss
	czytać czyt+aj+ć		czytam czyt+aj+m		read
	chować chow+aj+ć		chowam chow+aj+m		hide

Recall from (27a) that the 1st p.sg. non-past ending is  $+\epsilon$ , realized most commonly as  $[\epsilon]$  in standard or  $[\epsilon m]$  in non-normative speech. In the class of *aj*-stem verbs, exemplified in (29), only the nasal  $/m/$  surfaces in the 1st p.sg. non-past ending. Observe that the behavior of *aj*-stem verbs indicates that the  $//VN//$  analysis is more effective in accounting for the data. The ending is represented as  $//+m//$  for *aj*-stem verbs and as  $//+\epsilon m//$  for other classes. Under the assumption of  $//\tilde{v}//$ , on the other hand, the ending for the two classes is not even remotely similar:  $//+m//$  and  $//+\tilde{\epsilon}//$  respectively.

Under the  $//\tilde{v}//$  analysis, problems are also bound to arise when we consider alternations in certain neuter nouns.

(30)	nom.sg.		gen.pl.		gloss
	imi+ $\epsilon$ $[\epsilon]$		imi+on $[\text{ɔn}]$		name
	rami+ $\epsilon$ $[\epsilon]$		rami+on $[\text{ɔn}]$		arm

The assumption of a nasal vowel  $//+\tilde{v}//$  for the endings in (30) cannot be reconciled with the same representation of the verbal ending in *robi+ $\epsilon$*  in (27a). Observe that the two endings show diverse phonological behavior in that only the latter spawns  $/n/$ , as seen in the gen.pl. forms in (30). In contrast, the difference is straightforwardly encoded in the underlying representation if the  $//VN//$  approach is chosen: the  $+\epsilon$  contains  $//n//$  in the nominal ending in (30) and  $//m//$  in the verbal ending in (27a).

## 6. Arguments supporting nasal vowels in the underlying representation

An accurate account of nasal vowels wouldn't be complete without a look at the two major arguments used in support of nasal vowels in the underlying representation. First we examine vowel deletion in verbal stems (Bethin 1992: 57-8).

(31)	infinitive	1st p.sg. non-past	3rd p.sg. non-past	gloss
	kopnąć	kopnę	kopnie	kick
	krzyknąć	krzyknę	krzyknie	shout
	ciągnąć	ciągnę	ciagnie	pull
	zamknąć	zamknę	zamknie	close

If nasal vowels are underlying, the three forms for 'kick' in (31) are represented as:

(32)	//kɔp+nõ+tɕ//	//kɔp+nõ+ẽ//	//kɔp+nõ+ɛ//
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The nasal vowel is initially present in all the forms but is deleted in the course of the derivation in the two non-past forms via Vowel Deletion, (19). As expected, the context is met in *kopnę* and *kopnie*, but not in *kopnąć*, where a consonant follows. This line of reasoning encounters difficulties when words in (33) are considered.

(33)	infinitive	1st p.sg. non-past	3rd p.sg. non-past	gloss
	żąć	żnę	żnie	reap
	giąć	gnę	gnie	bend
	zacząć	zacznę	zacznie	start

In parallel to the words in (31), the forms for 'reap' are represented below.

(34)	//żõ+tɕ//	//żõ+ẽ//	//żõ+ɛ//
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The infinitive poses no problems, the correct surface form [ʒɔntɕ] is derived via nasal decomposition /õ/ → /ɔn/ and nasal assimilation /n/ → /ɲ/. The two non-past forms, however, are input to Vowel Deletion, (19), and surface without the nasal vowel in the stem. Thus, for instance, *żnie* //żõ+ɛ// ends up as [ʒɛ], rather than as the correct [ʒɲɛ]. The application of Vowel Deletion in the words in (33) produces incorrect results. It follows that the nasal vowel analysis does not

handle the verbs in (33), a numerous group among nasal vowel stems in the Polish verbal system.<sup>18</sup>

The second argument used by the proponents of underlying nasal vowels involves alternations in the nominal system (Bethin 1992: 62-5).

(35)	nom.sg.	gen.sg.	gloss
	mąż /ɔ̃w̃/	męż+a /ɛ̃w̃/	husband
	ząb /ɔm/	zęb+a /ɛm/	tooth
	dąb /ɔm/	dęb+u /ɛm/	oak
	wąż /ɔ̃w̃/	węż+a /ɛ̃w̃/	snake

On the assumption that the words in (35) are represented with underlying nasal vowels, the alternations of the front and back nasal vowels are best accounted for by invoking syllable structure.

(36)	Nasal Vowel Backing	$\tilde{\epsilon} \rightarrow \tilde{\text{ɔ}} /$	R

Rule (36) is responsible for backing /ɛ̃/ in a closed syllable. Nasal Vowel Backing applies in the words in the first column in (35), but not in the second, where the inflectional ending triggers the resyllabification of the preceding stem-final consonant.

There are two cases where the nasal vowel analysis fails under closer scrutiny. Gussmann (1980) provides a list of words that do not conform to the generalization in (36).

(37)	nom.sg.	gen.sg.	gloss
	przeciąg /ɔŋ/	przeciąg+u /ɔŋ/	draught
	wiąz /ɔ̃w̃/	wiąz+u /ɔ̃w̃/	elm
	pociąg /ɔŋ/	pociąg+u /ɔŋ/	train
	sęp /ɛm/	sęp+a /ɛm/	vulture
	piędź /ɛɲ/	piędz+i /ɛɲ/	handful

On the whole, the non-alternating forms are far more numerous than the alternating ones in (35). Thus, Nasal Vowel Backing becomes a marginal rule and cannot be used to support underlying nasal vowels. Fluctuating forms are equally devastating to Nasal Vowel Backing.

18 Alternatively, the rule of Vowel Deletion can be restricted to apply to oral vowels, but this is unenlightening.

(38)	nom.sg.	gen.pl.		gloss
	gęb+a /ɛm/	gęb /ɛm/	gąb /ɔm/	mouth
	mięs+o /ɛ̃w̃/	mięs /ɛ̃w̃/	miąs /ɔ̃w̃/	meat
	grzęd+a /ɛn/	grzęd /ɛn/	grząd /ɔn/	perch
	wstęg+a /ɛŋ/	wstęg /ɛŋ/	wstąg /ɔŋ/	ribbon

The nouns with no inflectional endings (gen.pl. in this case) show variation regarding the quality of the nasal vowel. Of the two gen.pl. forms for ‘mouth’, *gąb* undergoes Nasal Vowel Backing, whereas in *gęb* the rule fails to operate. As the argument for nasal vowels in the underlying representation rests on the rule of Nasal Vowel Backing, it is enough to undermine the productivity of the rule to refute the whole argument. Gussmann (1980) does precisely that when he asserts that of the two fluctuating forms, the non-alternating ones are gaining popularity.<sup>19</sup> The status of Nasal Vowel Backing in Polish phonology is questionable and the alternations in (35) are remnants of the *historical* rule of Nasal Vowel Backing.

## 7. Conclusion

We conclude that neither argument for underlying nasal vowels, //̃//, (Vowel Deletion and Nasal Vowel Backing) stands up to analysis. It is also shown that, as virtually no productive rule relies on underlying nasal vowels, they are plausibly viewed as obsolete. One might still advocate input nasal vowels, underlining their subsequent decomposition by rule. This decomposition, however, would have to take place prior to the rules that rely on it. In view of the facts that such rules are early cyclic rules and that no rules refer specifically to nasal vowels, a solution employing an early decomposition rule would be virtually indistinguishable from one with decomposition in the underlying representation. The derivations of the prescriptive and non-normative forms of *wziąć* ‘take’ raise even greater objections for the nasal vowel analysis. Without highly stipulative assumptions, the analysis fails on all counts. The discussion of innovations in “nasal vowels” strengthens this position. In consideration of the facts presented in this paper, “nasal vowels” are best represented as a sequence of an oral vowel and a nasal consonant //VN// in the underlying representation. We can venture a claim that historical nasal vowels have no role to play in contemporary Polish phonology.

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19 A reviewer points out that Nasal Vowel Backing also has problems accounting for the diminutives of the words in (35), such as *dąb+ek*, *ząb+ek*.

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## Argument structure of Czech event nominals\*

### 1. Introduction

Structures showing a mixed categorial behaviour, i.e. those that seem to share properties of more than one lexical category at a time, have always stood at the center of linguists' attention. The reason is obvious: they represent "a challenge for linguistic theory" – they offer a better view not only of the system of syntactic categories itself but also of its interplay with the architecture of functional categories that are superimposed on the lexical entry. One such categorially ambiguous structure, i.e. nouns which share many properties with verbs, stands in the focus of this paper: the nouns derived by the *-(e)ní/tí* suffix, which are concisely called "verbal nominals" or "verbal substantives" in Czech grammars. They have a very close counterpart in the English *ing-of* nominals, sometimes referred to as "action nominals" or "nominal gerund(ive)s".

- (1) *zničení*                      *měst-a*                      *nepřítel-em*  
 destroying<sub>NOM.SG</sub>    city<sub>GEN.SG</sub>            enemy<sub>INS.SG</sub>  
 "the destroying of the city by the enemy"

The main observation driving the analysis presented here is that Czech gerund nominals seem to have an argument structure identical to that of their corresponding verbs, so that they induce the same obligatory and optional argument positions as the corresponding verbal heads induce. Since argument structure is composed of the aspectual and the thematic analysis of a predicate in the sense that event participants are projected as syntactic arguments and any predicate lacking an aspectual analysis also lacks an argument structure, cf. Alexiadou (2001: 10), we talk about argument-supporting nominals as "event" or "process" or "action" nominals.

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\* This presentation is based on the M. Phil. thesis with the identical title which was submitted at the University of Tromsø in June 2006. I refer the interested reader to this work for acknowledgements, for an extended bibliography and for a more detailed discussion of the topic. Since the work is just a part of the ongoing research on Czech event nominals and nominalizing structures in general, the author appreciates any comments or suggestions for further research.

## 1.1. Approaches to nominalization

I am aware that there is a vast amount of literature devoted to the topic of nominalizations. In order to substantiate my approach to Czech nominalizations I review briefly just the most important works which had an impact on my reflecting upon the behaviour of nominals in *-(e)ní/tí*.

### 1.1.1. Chomsky's (1970) *Remarks on nominalization*

While Chomsky admits that gerunds of the type *John's refusing the offer* are derived by syntactic transformation of the base sentence-like structure, the limited productivity and structural properties of derived nominals such as *John's refusal/refusing of the offer* led him to the extension of base rules, and therefore to a simplification of the transformational component. Although Chomsky calls his approach "lexicalist", it is a matter of discussion whether the enrichment of the base rules is identical with the growth of lexicon, cf. Marantz (1997). Crucial for *Remarks* is the rejection of the distributional definition of categories stemming from the observation that not only verbs and adjectives but also nominals can take complements – so that grammatical categories must be distinguished just by their internal features.

### 1.1.2. Abney's (1987) *The English NP in its sentential aspect*

The first and the most influential work where the internal structure of nominals was analyzed on a par with the internal structure of verbs is Abney's (1987) doctoral dissertation. He proposes a functional structure of a nominal mirroring that of a verb, with the functional D-head being a parallel to the Infl-head of a clause. The novelty of Abney's approach is that non-lexical elements such as determiners of noun phrases are treated as heads of full phrases. A determiner represents a lexical instantiation of a functional D-head just as modals are lexical instantiations of a functional Infl-head.

### 1.1.3. Grimshaw's (1990) *Argument structure*

It was first suggested by Grimshaw that not only English "verbal" gerunds but also other derived nominals take obligatory arguments in the same sense as verbs. Of these, the *ing-of* action nominals represent the most consistent group of nonambiguous argument-takers (Grimshaw 1990: 67).

According to Grimshaw, it is the presence of the semantic event structure that determines the argument-taking properties of nominals: complex event nominals (CEN) are distinguished from simple event (EN) and result nominals

(RN) by the presence of the external Event argument in their lexico-semantic specification. This argument takes over the internal thematic arguments of a predicate but suppresses the agentive one:

- (2) a. EN/RN phrase structure: [Det(R) N(R)]  
 b. CEN phrase structure: [Det(Ev) N(Ev(x-0(y)))], where  
 x, y = inherited agentive and thematic arguments, 0 = suppression.

## 1.2. Lexicalism versus constructionalism

Today, we can basically distinguish two ways of accounting for the specific argument-structural and eventivity-related properties of nouns derived from verbs; they are traditionally labeled as “lexical” (or “lexicalist”) and “syntactic” (or “constructionalist”). In the first mentioned widespread approach it is the mapping between the verb and its derivatives in the lexicon that assigns to the derived forms shared lexical-semantic properties of the root. The argument-structure changing functions operate on lexical entries, being the source for the projected syntactic structure, which can thus be exclusively nominal. The syntactic account, defended here, ascribes properties common to both the verb and the verbal nominal to the “full phrasal syntactic projection of the stem within the structure of the derived word, relying on syntactic operations [...] to join together the stem and the affix” (Fu et al. 2001: 551).

There is no a priori reason for preferring one explanation over the other, just because nominalized verbs and their roots share selectional properties or have the same argument structure<sup>1</sup>. Both approaches, i.e. the one with an enriched lexicon as well the one with an enriched syntactic component, can account for this, as pointed out in Chomsky (1970). Only explicit empirical facts can serve as the basis for choosing one approach over the other, and I will argue that the Czech data presented in the following sections provide such evidence.

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1 As one of my reviewers noted there are in fact certain conceptual issues that argue in favor of the enriched syntactic component and against the enriched lexicon, such as for example having only one generative engine (the syntax component) for word-formation as well as sentence formation instead of having two, one for word-formation and a different one for sentence formation. These issues along with several others are pointed out and discussed in Marantz (1997), Marantz’s (2001) manuscript *Words*, Embick (2004), Alexiadou (2001) and similar works.

#### 1.2.4. Marantz's and Borer's syntactic derivational approach

When talking specifically about the syntactic analysis of event nominals, two theoretical findings should be pinpointed since they will be further employed in the analysis of the Czech counterpart to the English gerundive nominals:

1. According to Marantz (1997), *ing-of* nominalizations are “true” nominalizations in the sense that they are really made from verbs because they contain both a verbalizing v-head, which introduces the external argument, and a nominalizing D-head. This explains the changeable behaviour of roots under various nominalizing suffixes (including zero-derivation) and under the *-ing* suffix.
2. The presence of functional structure licences internal arguments. In Borer (1999) their presence gives rise to “verbalization” in the sense of syntactic structural determination of a (category-neutral) root. The syntactic operation joins the (verbalized) stem and the derivational suffix; the common verbal-nominal part of the fully projected stem is what accounts for the properties shared between verbs and event nouns.

## 2. Proposal

Czech *-(e)ni/tí* nouns primarily denote (simple) states or events but can refer to results of events as well. In this paper I focus on their eventive interpretation. I propose that these nouns represent the Czech counterpart to the English *ing-of* eventive nominals in that they license argument positions to the same extent as the corresponding verbal structures.

In contrast to Grimshaw's lexicalist approach, I use a purely syntactic analysis in terms of a finely articulated functional sequence: I claim that only the presence of the extended verbal projection (including VoiceP/vP and AspP but not Tense/InflP) within the nominal projection (NP) can account for all the generalizations regarding the morphosyntactic structure of *-(e)ni/tí* nominals. I argue in line with van Hout and Roeper (1998) that it is the feature checking defined on event-related projections which captures the morphological structure of nominalizations. My main evidence is based on Case assignment in these nominals, and on their aspectual properties.

### 3. Data

#### 3.1 The case-marking pattern of event nominals

##### 3.1.1. Intransitive predicates

The sole argument of intransitives can occur in two possible slots, either postnominally in genitive case (GEN) or prenominally as a possessive (POSS). While basically any type of a DP can have the form of postnominal GEN, cf. (3a), prenominal POSS can be filled only by one-word animate subjects in the singular, as only declinable nominals of this type can have the form of a possessive adjective in Czech, cf. (3b):

- (3) a. *zívání*                    *tatínk-a* /    *naš-eho* *tatínk-a* /    *děť-i*  
 yawning<sub>NOM.SG</sub> father<sub>GEN.SG</sub>    our<sub>GEN.SG</sub> father<sub>GEN.SG</sub>    child<sub>GEN.PL</sub>  
 “father’s/our father’s/children’s yawning”
- b. *tatínk-ov-o*                    *zívání*  
 father<sub>POSS-NOM.SG</sub> yawning<sub>NOM.SG</sub>  
 “father’s yawning”

##### 3.1.2. Transitive predicates

Transitive event nouns generally have three slots where structural arguments can appear: postnominally in genitive case (GEN), postnominally in instrumental case (INS) and prenominally as a possessive (POSS). In addition, there is a strict ordering of postnominal positions: INS can never precede GEN.

The internal argument (IA) can have either the GEN form as in (4a) and (4c) or the POSS form as in (4b), on a par with the only argument of intransitive predicates. For the external argument (EA), the agentive INS form is available, (4a), (4b). If the agent noun fulfills the requirements of a possessive formation, it can go to POSS as in (4c):

- (4) a. *oloupení*                    *stařenk-y*                    *zloděj-em*  
 robbery<sub>NOM.SG</sub>                    grandma<sub>GEN.SG</sub>                    thief<sub>INS.SG</sub>  
 “the robbery of the grandam by the thief”
- b. *stařenč-in-o*                    *oloupení*                    *zloděj-em*  
 grandma<sub>POSS-NOM.SG</sub> robbery<sub>NOM.SG</sub>                    thief<sub>INS.SG</sub>  
 “the grandam’s robbery by the thief”
- c. *zloděj-ov-o*                    *oloupení*                    *stařenk-y*  
 thief<sub>POSS-NOM.SG</sub> robbery<sub>NOM.SG</sub>                    grandma<sub>GEN.SG</sub>  
 “the thief’s robbery of the grandam”

If the IA is not expressed (for example, because it is understood from the context/knowledge) while the EA is still present overtly, the latter has to leave INS aside and fill in GEN as in (5b) (one-word animate agent then again usually raises to POSS as in (5c)):

- (5) a. *vyprávění* \*(*pohádek*) *ovčí* *babičk-ou*  
telling<sub>NOM.SG</sub> fairy-tale<sub>GEN.PL</sub> sheepish<sub>INS.SG</sub> grandma<sub>INS.SG</sub>  
“the telling of fairy-tales by the sheepish grandma”
- b. *vyprávění* *ovčí* *babičk-y*  
telling<sub>NOM.SG</sub> sheepish<sub>GEN.SG</sub> grandma<sub>GEN.SG</sub>  
“the sheepish grandma’s telling”
- c. *babičč-in-o* *vyprávění*  
grandma<sub>POSS-NOM.SG</sub> telling<sub>NOM.SG</sub>  
“the grandma’s telling”

The examination of intransitive and transitive predicates’ behaviour under nominalization suggests that the genitive position licensed by the noun has the character of a structural position similar to NOM and ACC structural positions with verbs. It is not thematically limited since both the patient and the agent argument can occur in this position but there is a clear hierarchy in assigning the position to distinct arguments: GEN can never host the agentive argument if the thematic one is present. If we compare the finite verb structure to the nominal structure, the following pattern emerges:

- (6) a. Structural-Case assignment, nominative-accusative languages

	<b>Subj<sub>INTR</sub></b>	<b>Subj<sub>TR</sub></b>	<b>Obj</b>
<b>active CP</b>	NOM	NOM	ACC
<b>passive CP</b>	–	INS	NOM
<b>event NP</b>	GEN	INS	GEN

The table shows that event nominals are similar to passive structures in assigning the specific case form (INS) to the deep subject of transitives and the structurally prominent position (NOM/GEN) to underlying objects. However, nominals differ from passives in that their structural GEN is, in case the IA is missing, filled by the underlying subject, which cannot happen in a passive clause. The Case pattern of verbal nouns thus fits better into the pattern of ergative languages: not only do ergative languages have a specific form for the subject of transitives but they also form finite structures on the basis of intransitive predicates, in which case the ergative verb assigns the same Case to the subject of intransitives as to the object of transitives; cf. Dixon (1979, 1994).

## b. Structural-Case assignment, ergative-absolutive languages

	<b>Subj<sub>INTR</sub></b>	<b>Subj<sub>TR</sub></b>	<b>Obj</b>
<b>active CP</b>	ABS	ERG	ABS
<b>event NP</b>	GEN	INS	GEN

This observation is not a new one. Analyzing the agentive *by*-phrase within nominals as an ergative Case marker and the *of*-phrase as an absolutive Case marker was proposed in Williams (1987: 366–367) and is common for many works on nominalizations, see e.g. Alexiadou (2001: 18, 119), Zucchi (1989: 190).

## 3.1.3. Predicates with an inherently case-marked argument

As expected, if there is an inherent case on an argument, the same case as in the verbal structure is preserved also in the nominal. Interestingly, the behaviour of the argument which gets structural Case indicates the relevance of the unergative versus unaccusative predicate distinction in Czech. Arguments which normally correspond to the surface nominative subjects in active verbal structures behave differently in the nominal structure according to whether they correspond to the underlying subjects (agents) or whether they are underlying objects (themes).

The nouns with the apparent agent character behave the same way as was predicted for EAs of normal transitive predicates: they can have the form of GEN, (7c) (which is available on account of a missing direct object which would normally occupy it) but also the form of INS, (7b) (as if the dative filled the postnominal structural position):

- (7) a. *Starostliv-á*      *matk-a*      *domlouv-á*      *syn-ovi*.  
worried<sub>NOM.SG</sub>      mother<sub>NOM.SG</sub>      talk-to<sub>3.SG.PRES</sub>      son<sub>DAT.SG</sub>  
“The worried mother is talking to her son.”
- b. *domlouvání*      *syn-ovi*      *starostliv-ou*      *matk-ou*  
talking-to<sub>NOM.SG</sub>      son<sub>DAT.SG</sub>      worried<sub>INS.SG</sub>      mother<sub>INS.SG</sub>  
“talking-to the son by his worried mother”
- c. *domlouvání*      *starostliv-é*      *matk-y*      *syn-ovi*  
talking-to<sub>NOM.SG</sub>      worried<sub>GEN.SG</sub>      mother<sub>GEN.SG</sub>      son<sub>DAT.SG</sub>  
“the worried mother’s talking-to her son”

By contrast, surface subjects of predicates with an unaccusative character are ungrammatical as instrumentals, cf. (8b). If they don’t have the morphosyntactic potential to form a possessive, they can go only to GEN, (8c):

- (8) a. *Št'astn-ý vězeň unik-á strážník-ům.*  
 happy<sub>NOM.SG</sub> prisoner<sub>NOM.SG</sub> escape<sub>3.SG.PRES</sub> policeman<sub>DAT.PL</sub>  
 “The happy prisoner escapes the policemen.”
- b. \**unikání strážník-ům št'astn-ým vězn-ěm*  
 escaping<sub>NOM.SG</sub> policeman<sub>DAT.PL</sub> happy<sub>INS.SG</sub> prisoner<sub>INS.SG</sub>  
 “the escaping to the policemen by the happy prisoner”
- c. *unikání št'astn-ého vězn-ě strážník-ům*  
 escaping<sub>NOM.SG</sub> happy<sub>GEN.SG</sub> prisoner<sub>GEN.SG</sub> policeman<sub>DAT.PL</sub>  
 “the happy prisoner’s escaping to the policemen”

The comparison of (7) and (8) clearly shows that the – presumably structural – difference between unergative and unaccusative verbs is relevant for the structural setout of a nominal phrase even though the distinction is overridden on the level of a finite active clause, obviously by the need for a nominative subject associated with [+NOM] and [EPP] features on Tense/Infl.

On the other hand, when we look at a finite passive clause derived from the corresponding verb we find a parallel to the above noticed fact: only unergative-like intransitives allow the impersonal passives with EA in INS while those with an unaccusative character cannot be impersonally passivized, (9):

- (9) a. *Syn-ovi by-lo domlouvá-n-o*  
 son<sub>DAT.SG</sub> pro<sub>3.SG</sub> be<sub>3.SG.PAST</sub> talk-to<sub>PASS-NOM.SG</sub>  
*starostliv-ou matk-ou.*  
 worried<sub>INS.SG</sub> mother<sub>INS.SG</sub>  
 “It was talked to the son by his worried mother.”
- b. \**Strážník-ům by-lo utíká-n-o*  
 policeman<sub>DAT.PL</sub> be<sub>3.SG.PAST</sub> escape-<sub>PASS-NOM.SG</sub>  
*št'astn-ým vězn-ěm.*  
 happy<sub>INS.SG</sub> prisoner<sub>INS.SG</sub>  
 “It was escaped to the policemen by the happy prisoner.”

### 3.1.4 Summary

On the basis of the data examined in this section we can summarize the Case-mapping within Czech event nominals:

- (10) 1. If IA gets [+GEN] then EA can get [+INS] (or [+POSS])<sup>2</sup>  
 2. If IA gets [+POSS] then EA can get [+INS]  
 3. If IA=0 then EA can get [+GEN] (or [+POSS])<sup>3</sup>

2 POSS licensing is in brackets because it is always conditioned by further morphosyntactic features of a noun such as [+HUM] or [+SG].

The hierarchy among the (morphologically unlimited) nominal syntactic positions with a particular thematic interpretation is therefore as follows:

- (11) • nominal positions with theme interpretation: GEN  
 • nominal positions with agent interpretation: GEN >> INSTR  
 • nominal positions for oblique-case arguments: identical with verbs

We can observe that if there is only one argument and that argument does not have inherent case, it must surface in the genitive (or as a possessive adjective), regardless of whether it is an agent or a theme.

Given that there is exactly one position assigning structural Case (GEN) within the DP and given that only agents can alternatively acquire instrumental case, the following hierarchical ordering arises between the external and the internal argument when they compete for the GEN position: IA >> EA.

### 3.2. Aspect-sensitive obligatoriness of internal arguments

If the *-(e)ní/tí* nominal is derived from an imperfective verb which has an internal argument, this internal argument does not always have to be expressed overtly with a nominal, as in (12b), but can be just “implicitly satisfied by being existentially quantified over” (Zucchi 1989: 185 et seq.). On the other hand, nominal structures derived from perfectives that have an internal argument become ungrammatical unless their object position gets filled by some overt DP, see (13b). Active verbal structures behave identically concerning the necessity of the IA’s overt expression:

#### 3.2.1. Imperfectives

- (12) a. *Všichni dět-i maluj-í (rádi-o).*  
 all child<sub>NOM.PL</sub> draw<sub>IMPF-3.PL.PRES</sub> radio<sub>ACC.SG</sub>  
 “All the children draw the radio.”
- b. *Malování (rádi-a) zabra-lo hodin-u.*  
 drawing<sub>IMPF.NOM.SG</sub> radio<sub>GEN.SG</sub> take<sub>IMPF-3.SG.PAST</sub> hour<sub>ACC.SG</sub>  
 “Drawing the radio took the whole hour.”

---

3 Two cases of missing IA are subsumed under the 0-label: either there is no IA at all as in the unergative structure, or it is just not phonologically expressed.

### 3.2.2. Perfectives

- (13) a. *Komis-e oznámi-la \*(výsledk-y).*  
 committee<sub>NOM.SG</sub> announce<sub>PF-3.SG.PAST</sub> result<sub>ACC.PL</sub>  
 “The committee announced results.”
- b. *Oznámení \*(výsledk-ů) proběh-lo ve chvílčc-e.*  
 announcement<sub>PF.NOM.SG</sub> result<sub>GEN.PL</sub> pass<sub>PF-3.SG.PAST</sub> in while<sub>LOC.SG</sub>  
 “The announcement of results passed in a while.”

### 3.2.3. Perfectives with inherently case-marked arguments

If our prediction in 3.1.3. about the EA versus the IA character of the DP in postnominal Genitive was right, then those nominal structures should behave differently also with respect to their sensitiveness to the [ $\pm$ PERF] value of a nominal. This prediction seems to be borne out. All cases where the expression of the argument (in GEN or POSS) is felt as necessary are limited to perfective nominals with an unaccusative character. On the other hand, the DP licensed as agent in a deep-subject position of Spec,vP is never obligatory, not even in case of a perfectivized stem:

- (14) *uniknutí \*(vězn-ě) strážník-ovi*  
 escaping<sub>PF.NOM.SG</sub> prisoner<sub>GEN.SG</sub> policeman<sub>DAT.SG</sub>  
*během pracovní dob-y*  
 during working<sub>GEN.SG</sub> time<sub>GEN.SG</sub>  
 “the prisoner’s escaping the policeman during the working time”
- (15) *ublížení (otrokář-e) otrok-ovi*  
 hurting<sub>PF.NOM.SG</sub> slaver<sub>GEN.SG</sub> slave<sub>DAT.SG</sub>  
*během prác-e na plantáž-i*  
 during work<sub>GEN.SG</sub> on plantation<sub>LOC.SG</sub>  
 “the slaver’s hurting the slave during the work in the plantation”

### 3.3. Aspectual morphology of event nominals

Another fact which draws a close parallel between verbal and eventive nominal structure is that only *-(e)ní/tí* nouns but not other event-denoting nouns systematically morphologically “inflect for aspect”, to the same extent as the corresponding verbs:

- (16) a. *číst* “read<sub>IMPF.INF</sub>” – *pře-číst* “PF-read<sub>INF</sub>”  
 b. *čtení* “reading<sub>IMPF.NOM.SG</sub>” – *pře-čtení* “PF-reading<sub>NOM.SG</sub>”  
 c. *četba* “reading<sub>NOM.SG</sub>” – *\*pře-četba* “PF-reading<sub>NOM.SG</sub>”

The whole variety of perfectivizing, secondary imperfectivizing and iterativizing affixes which are possible with event nouns<sup>4</sup> is nicely exemplified by the flexibility of the noun *dělání* “doing” (derived from *dělat* “to do”). If you compare the noun’s inflectional forms based on an imperfective stem in (17b) and those based on a perfective stem in (18b) with the forms in (17c) and (18c) you can see that although there exists another nominalizing suffix which can attach to the same verb, namely *-ka*, it is limited to just one grammatical “inflectional form” of a noun – in contrast to the whole scale of grammatical forms in case of the *-(e)ní/tí* suffix.

(17)	a.	<i>děla-l</i> do <sub>IMPF-3.SG.PAST</sub> “(he) did, (he) worked”	<i>děláv-a-l</i> do <sub>IMPF-ITER-3.SG.PAST</sub>	<i>děláv-áv-a-l</i> do <sub>IMPF-ITER-ITER-3.SG.PAST</sub>
	b.	<i>dělá-ní</i> do <sub>IMPF-NOM.SG</sub> “doing, working”	<i>děláv-á-ní</i> do <sub>IMPF-ITER-NOM.SG</sub>	<i>děláv-áv-á-ní</i> do <sub>IMPF-ITER-ITER-NOM.SG</sub>
	c.	* <i>děl-ka</i> do <sub>IMPF-NOM.SG</sub>	* <i>děl-áv-ka</i> do <sub>IMPF-ITER-NOM.SG</sub>	* <i>děl-áv-áv-ka</i> do <sub>IMPF-ITER-ITER-NOM.SG</sub>
(18)	a.	<i>do-děla-l</i> PF-do <sub>-3.SG.PAST</sub> “(he) finished”	<i>do-děláv-a-l</i> PF-do <sub>-2IMPF-3.SG.PAST</sub>	? <i>do-děláv-áv-a-l</i> PF-do <sub>-2IMPF-ITER-3.SG.PAST</sub>
	b.	<i>do-dělá-ní</i> PF-do <sub>-NOM.SG</sub> “finishing”	<i>do-děláv-á-ní</i> PF-do <sub>-2IMPF-NOM.SG</sub>	? <i>do-děláv-áv-á-ní</i> PF-do <sub>-2IMPF-ITER-NOM.SG</sub>
	c.	* <i>do-děl-ka</i> PF-do <sub>-NOM.SG</sub>	<i>do-děl-áv-ka</i> PF-do <sub>-2IMPF-NOM.SG</sub> “finishing operation”	?? <i>do-děl-áv-áv-ka</i> PF-do <sub>-2IMPF-ITER-NOM.SG</sub>

4 One of my reviewers remarked that secondary imperfective suffixes in Slovenian occur only in *-(e)ní* nominals, which might suggest that they contain more verbal structure than *-tí* nominalizations. The same is true for Czech and it holds also for *-(e)n* versus *-t* participles derived from verbs. As I showed in Procházková (2006), *-tí* suffix is in Czech actually limited to verbs in *-nu-* and verbs with a zero thematic suffix. Since all secondarily imperfectivized verbs have the thematic *-a-* suffix, they can never join the *-t*-participial/nominal suffix. Therefore the difference between *-(e)ní* vs. *-tí* nominalization (and between *-(e)n* vs. *-t* participles) cannot simply reflect a difference in the amount of verbal structure in the suggested sense. I do not claim here anything about how much of a verbal structure is involved in stems with different thematic suffixes and how *-(e)n* vs. *-t* participial suffix relates to this.

### 3.4. Adverbial modification

Various aspects of events denoted by event nominals are usually expressed by adjectives rather than by adverbs; nevertheless, adverbial modification of Czech event nominals is not excluded. Adjectival modification provides evidence for the presence of a nominal functional structure in the verbal noun. At the same time, the possibility of the alternative adverbial modification, usually limited to heavy AdvPs, provides support for the inclusion of some part of verbal functional structure within the nominal:

- (19) a. *opravdu* *precizní* *nakreslení* *návrh-u*  
 really precise<sub>NOM.SG</sub> drawing<sub>NOM.SG</sub> design<sub>ACC.SG</sub>  
 “the really precise drawing of the design”
- b. ? *nakreslení* *návrh-u* *opravdu* *precizně*  
 drawing<sub>NOM.SG</sub> design<sub>ACC.SG</sub> really precisely  
 “the drawing of the design really precisely”

However, not all types of adverbs can appear with Czech *-(e)ní/tí* nouns. While manner (*quickly, precisely*), temporal (*this year, the day ago*) and aspectual (*monthly, for/in an hour*) adverbs can occasionally be used to modify them, modal (*probably, possibly, certainly*) and speaker-oriented (*fortunately*) adverbs never occur with event nominals (see Alexiadou 2001: 48 for similar observations for Greek and Hebrew). The fact that only lower VP-adverbs and not sentential or InflP-adverbs are permitted in nominalizations argues that it is specifically the VP which is present and not InflP or other higher functional projections:

- (20) a. *oznámení* *výsledk-ů* (*teprve*) *předevčirem*  
 announcement<sub>NOM.SG</sub> result<sub>GEN.PL</sub> not-until day-before-yesterday  
 “the announcement of results (not until) the day before yesterday”
- b. *předevčerejší* *oznámení* *výsledk-ů*  
 day-before-yesterday’s<sub>NOM.SG</sub> announcement<sub>NOM.SG</sub> result<sub>GEN.PL</sub>  
 “the day before yesterday’s announcement of results”
- (21) a. *splácení* *půjčk-y* *měsíčně* / *po dva rok-y*  
 paying<sub>NOM.SG</sub> loan<sub>GEN.SG</sub> monthly / for two year<sub>ACC.PL</sub>  
 “the paying of a loan monthly/for two years”
- b. *dvoulet-é* / *měsíční* *splácení* *půjčk-y*  
 two-year-<sub>NOM.SG</sub> / month<sub>NOM.SG</sub> paying<sub>NOM.SG</sub> loan<sub>GEN.SG</sub>  
 “the two-year/month’s paying of a loan”

- (22) a. \**přistání*                    *letadl-a*      *možná*  
           landing<sub>NOM.SG</sub>            plane<sub>GEN.SG</sub> possibly  
           “the landing of the plane possibly”
- b. *možn-é*                    *přistání*                    *letadl-a*  
           possible<sub>NOM.SG</sub>            landing<sub>NOM.SG</sub>            plane<sub>GEN.SG</sub>  
           “the possible landing of the plane”

#### 4. Analysis

The previous sections discussed in detail some of the specific properties of Czech eventive nominals in *-(e)ni/tí*. This section sketches my analysis of these nominals in terms of the functional projections and morphosyntactic features associated with them. It shows that it is precisely the part of the verbal functional sequence embedded in the nominalized structure which can systematically account for the regularities we have observed.

##### 4.1. IA-licensing VP

We have made the important observation in 3.1. that *-(e)ni/tí* nominals preserve not only the lexically case-marked arguments but also the argument which gets the structural object Case (manifested in the finite clause by accusative morphological case). This internal argument of the verbal functional structure changes its form to structural Genitive in the nominal structure but fulfills the same Case-marking requirements that internal arguments of verbs in ergative languages have to fulfill. Implementing the analysis of Hale and Keyser (1993, 1998) I conceive the IA of event nominals as being introduced by the *v* of the “become” type<sup>5</sup>. Embick (2004a) marks the BECOME-operator denoting a transition event that moves towards a state with the [FIENT] feature, for “fientive”, in order to avoid the unwanted association of the traditionally used [BECOME] feature with telic events.

In addition, we have noticed in 3.2. that (lexical) perfective prefixes, presumably introduced already at the VP level, occur within event-denoting nominals and they interplay with (syntactic) secondarily imperfectivizing suffixes; for an implementation see e.g. Ramchand (2006), where the representation of Slavic prefixes within the decomposed VP-structure is provided. The final phrase marker which would account for the above mentioned facts should thus look as in:

- (23) a.     [<sub>DP</sub>(DP<sub>1</sub>) D(+POSS) [<sub>NP</sub>(t<sub>1</sub>) N(+GEN)...[<sub>VP</sub>V t<sub>1</sub>]]]

5 I use the capital V notation for this type of verbal head in phrase marking diagrams.

- b.  $[_{DP} D(+POSS) [_{NP} (DP_1) N(+GEN)...[_{VP} V t_1]]]$

#### 4.2. EA-licensing v/VoiceP

In 3.1. we have seen that the explicit external argument behaves on a par with EA in ergative languages in getting structural Gen if the structure is intransitive; however, EA can always be just covert, which is in contrast to the ergative pattern and in accordance with passive structures. In the case of an eventive interpretation of a nominal, this implicit EA can always be accessed (overall possibility of agent-oriented modifiers, control phenomena):

- |         |                    |                  |                      |                 |
|---------|--------------------|------------------|----------------------|-----------------|
| (24) a. | <i>opakované</i>   | <i>záměrné</i>   | <i>překračování*</i> | <i>(hranic)</i> |
|         | “the repeated      | deliberate       | crossing             | of borders”     |
| b.      | <i>uprchlíkovo</i> | <i>opakované</i> | <i>překračování*</i> | <i>(hranic)</i> |
|         | “the refugee’s     | repeated         | crossing             | of borders”     |

On the basis of examples which evince the presence of the agentive argument in the structure of eventive nouns and its dependence on the (explicit or contextually understood) presence of the IA, I argue for the presence of a functional head which introduces the external argument in these nominals. In this sense, my solution is similar to Marvin’s (2007) analysis of Slovenian *-l* participle nominalizations in *-ec* (presented in this volume, see pages 165-186) which contain the verbalizing *v* head. (On the other hand, the *-(e)n/t* in Czech eventive nominalizations obviously contrasts to *-(e)n/t* in Slovenian nominalizations discussed by Marvin, which, according to her, functions as a nominalizer that attaches directly to the root.)

Following Marantz (1984) and Kratzer (1996) I am assuming a separate Voice head as a non-overt head introducing the agent. Transitive structures combine the resultative VP introducing IA with a higher VoiceP (*vP* in Chomsky’s 1995 terms) of the event type which introduces the external argument and licenses the causative semantics of a verb (see Pylkkänen 2002).

The presence or absence of a category of Voice is assumed to be the determining factor for the classification of unergative and unaccusative predicates. It is a basic property of unaccusative structures that their single argument is the underlying object and that a separate head introducing the agent argument is not projected (see Embick 2004b and Alexiadou and Anagnostopoulou 2004 for the discussion of this assumption). In the case of unaccusatives, the structure in (23) thus already represents the full *vP*.

The fact that an unergative versus an unaccusative structure behaves differently with respect to Case-assignment within nominals, as we have observed in 3.1.3., provides one more argument for the presence of a category of

Voice in an event nominal's functional sequence. Moreover, aspect-sensitive obligatoriness of nominal arguments interacts with the unergative versus unaccusative split as well, cf. 3.3.3. In order to capture all these generalizations the eventive nominal's phrase marker should be extended in the following way:

- (25) a.  $[_{DP}(DP_2) D(+POSS) [_{NP}(DP_1) N(+GEN)...[_{vP} t_2 v [_{VP} V t_1]]]]$   
 b.  $[_{DP}(DP_1) D(+POSS) [_{NP}(t_1) N(+GEN)...[_{vP} t_2 v [_{VP} V t_1]]]]$

The two phrase markers correspond to two ways of argument realization: either IA ( $DP_1$ ) gets structural Genitive and EA ( $DP_2$ ) surfaces as a prenominal Possessive, or IA raises from the Genitive to the Possessive and EA gets INS associated with Spec,vP (cf. Collins 2005).

### 4.3. AspectP within NP

In sections 3.2. to 3.4. I provided many types of evidence for the claim that it is not just the full vP-shell that is necessary for the derivation of eventive nominals, but functional aspectual structure as well:

1. if a verb ends up as perfective when both lexical and syntactic aspect combine, the verb's need for an overt object is preserved also with the event-denoting nominal derived from this verb
2. all types of secondary (syntactic) aspectual suffixes combine with nominals in *-(e)ní/tí*
3. the "lower" adverbial modification of these nominals is possible

I assume that all patient DPs of verbs move through a position corresponding to Borer's (1994; 1999) Spec,Asp<sub>E</sub> and that in Czech such a movement is obligatory in case of a [+PERF] value of the aspectual head. Note, however, that for Borer the Asp<sub>E</sub> is responsible not only for "measuring the event" by checking for N/D features but also for the theme-like interpretation of the moved DP itself. In the present analysis, it is the resultative VP that licenses the theme. (This allows us to explain the fact that both eventive and resultative nouns can have complements, which is unexpected under Borer's approach where arguments are introduced by higher eventive categories).

Although the event is always interpreted as measured at LF, Czech imperfective verbs also allow a "dummy" theme which corresponds to a covert general indefinite pronoun. This type of implicit internal arguments could be analyzed as existentially closed within the vP. This captures the fact that in the absence of a [+PERF] aspectual feature the DP movement from the resultative VP to Spec,Asp<sub>E</sub>P is optional so that imperfective verbs can but do not have to appear complemented by their objects.

The above described mechanism accounts for the aspectual behaviour of Czech verbs. But if we acknowledge the existence of the head of Asp<sub>E</sub> type within the eventive nominal's structure too, we can explain the fact that the nominal GEN (or POSS) must be obligatorily filled by the internal argument only in the case of perfective verbal nominals, as in (13b).

- (26) a.  $[_{DP}(DP_2) D(+POSS) [_{NP} DP_1 N(+GEN)...[_{AspP} t_1 Asp(+PF) [_{VP} t_2 v$   
 $[_{VP} V t_1]]]]]$   
 b.  $[_{DP}(DP_1) D(+POSS) [_{NP} DP_1 N(+GEN)...[_{AspP} t_1 Asp(+PF) [_{VP} t_2 v$   
 $[_{VP} V t_1]]]]]$

One might ask how the IA can cross the EA to get to Spec,AspP and then again – how can the EA cross the IA in Spec,NP on its way to Spec,DP. This double crossing – rather than nesting – is something that actually follows from Relativized Minimality although it might look at first sight as its violation. If both the movements, the IA movement into Spec,AspP and the EA movement into some higher functional projection above it, are movements of the same type, and then again the same holds for IA movement to postnominal Genitive and EA movement to prenominal Possessive, then the structure actually maintains the RM reinterpreted by Starke (2001) in terms of chains rather than in terms of landing sites: “ $\alpha$ -chain<sub>1</sub> may not ‘cross’  $\alpha$ -chain<sub>2</sub> as a whole”. In other words, the IA >> EA ordering which we have detected in the case of event nominals (3.1.4.) is a pattern which follows from a generalized RM condition, a path containment restriction:

- (27)  $*\alpha_j \alpha_i \dots \alpha_i \alpha_j$  (Starke 2001: 79)

## 5. Conclusions

This article certainly could not exhaust the topic of the argument structure of Czech event nominals. Rather, it just summarizes the data in a systematic way and reflects a bit about them, which evokes many new issues and questions that could not be discussed here for reasons of space. Still, I hope that the analysis I proposed in order to describe the functional architecture of *-(e)ní/tí* nominals throws at least some light on the argument-licensing properties of these nominals, and that it can serve as a basis for further research within the field of Czech nominalizations and nominalizations in general.

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## Morphological complexity and obstruent devoicing in Slovene

### 1. Introduction

This paper investigates obstruent devoicing in Slovene and argues that devoicing is loss of melodic material in unlicensed positions. These typically (but not exclusively) occur at the end of phonological domains and can therefore be regarded as a phonological reflection of morphological information in phonology. It is shown on purely phonological grounds why the process of devoicing should take place word-finally in some cases (i.e., in words belonging to major morphosyntactic categories) but not in others (i.e., in prepositions). Also discussed is how and when the process of voice assimilation may sometimes obscure the effects of devoicing.

The analysis is couched within the framework of Government Phonology (Kaye et al. 1985, 1990), more precisely in the Strict CV approach (Lowenstamm 1996, Szigetvári 1999, Scheer 2004). The theory of the phonology-morphology interface is adopted from Kaye (1995).

### 2. The facts

Obstruents in Slovene always undergo devoicing utterance-finally or before a voiceless obstruent, (1).<sup>1</sup>

- |     |            |                             |
|-----|------------|-----------------------------|
| (1) | [mlat]     | <i>mlad</i> ‘young, M’      |
|     | [mlat pəs] | <i>mlad pes</i> ‘young dog’ |
|     | [glatka]   | <i>gladka</i> ‘smooth, F’   |

At the same time they never seem to undergo devoicing when preceding a vowel or a sonorant in word-medial position, (2a) or before a voiced obstruent in any position, (2b).<sup>2</sup>

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1 The assumption that the examples in (1) show obstruent devoicing rather than contain an underlyingly voiceless obstruent is based on the existence of morphosyntactically related words containing a voiced obstruent, such as *mlada* [mlada] ‘young, F’ and *gladek* [gladək] ‘smooth, M’. The nature of the underlying obstruent is preserved in the Slovene orthography.

2 Devoicing facts in (1) and (2) do not seem to be conditioned by morphological/syntactic complexity of a given phonological string, therefore the exact morphological/syntactic structure of each of the examples need not concern us here.

- (2) a. [mladost]      *mladost* ‘youth’  
       [odnos]        *odnos* ‘relationship’  
       b. [mlad bik]    *mlad bik* ‘young bull’  
       [zgradba]      *zgradba* ‘building’

But crucially, they undergo devoicing word-finally before a sonorant or a vowel in the next word, as in (3a) but not in (3b).

- (3) a. [mlat moʃ]      *mlad mož* ‘a young man’  
       [mlat oʃe]        *mlad oče* ‘a young father’  
       b. [pod moʒem]    *pod možem* ‘under a man’  
       [pod oʃetom]     *pod očetom* ‘under a father’

A closer look will reveal that this kind of variation is not free, but morphosyntactically conditioned: obstruent devoicing applies only at the end of words belonging to major morphosyntactic categories (so-called content words), but not at the end of prepositions immediately preceding their complements. This phenomenon is not unique to Slovene but is also found in other Slavic languages. Hall (2003) observes a similar phenomenon in Czech, and proposes that a preposition and its object form a single prosodic word so the final obstruent in the preposition is not in a position to undergo word-final devoicing. Padgett (2006) analyzes similar facts in Russian the same way by reference to category of prosodic word. Once one uses a notion such as a prosodic word in the analysis of devoicing the explanation becomes trivial.

Government Phonology (GP) framework does not permit reference to categories of the prosodic hierarchy. How do we, then, account for phonological processes that are clearly triggered by a certain morphological environment?

Similarly to prosodic phonology (PP), GP sees phonology as an independent system with its own vocabulary apart from syntactic or morphological rules, and syntax and morphology cannot understand phonological vocabulary. Since phonology has no access to morpho-syntactic information, this information has to be translated. In PP it is the mapping rules that transform higher level information into the structure of the prosodic hierarchy which phonology can refer to. GP sees (at least) two major problems with this (Scheer, in press). First, phonology can only operate with domestic phonological objects (i.e., objects existing in phonology independently) and the created prosodic domains are not among them. Prosodic constituents exist exclusively to store extra-phonological information. For this reason Scheer (in press) sees them as a version of boundaries that share with the latter their diacritic nature and should therefore not appear in a linguistic theory. Second, there is no causal relation between a morphological environment and the nature of a phonological process

applying in this environment. This means that in principle anything can be a phonological outcome, which is empirically not true. In addition, in working with (non-linear) prosodic categories there is another very important fact that should but cannot follow from the theory, namely, morpho-syntactic information influences phonology at word (or morpheme) edges and never word (or morpheme)-medially.

In this paper I will show that devoicing of obstruents in Slovene behaves in the only possible way, given the predictions of the theory of GP.

### 3. Morphology determines phonological domains

Kaye (1995: 302) proposes that “morphological structure has two effects on the phonology: little and none”. He calls the former type of interaction between morphology and phonology analytic and the latter non-analytic, and argues that analytic morphology is visible to phonology due to its ability to project the phonological domain, while non-analytic morphology does not have this ability and is thus invisible to phonology. Unlike Prosodic Phonology, Kaye’s model does not distinguish between different types of (prosodic) categories. His use of the notion phonological domain is only meant to convey the idea of a (linear!) string of a certain size to which phonology is applied simultaneously.

In order to illustrate how morphological structure is reflected in phonology let us take a look at the English examples *finger* [fɪŋgə], *singer* [sɪŋə] and *longer* [lɒŋgə]. The analysis relies on the observational fact that in English the sequence [ŋg] is not allowed to occur domain-finally, while it is perfectly legal domain-internally. The pronunciation of a morphologically simplex word *finger* as [fɪŋgə] suggests that the [ŋg] sequence is domain-internal. The proposed size of the smallest domain submitted to phonology by morphology is therefore the whole string [*finger*] (italicized square brackets represent domain boundaries).

On the other hand, the pronunciation of *singer* [sɪŋə] suggests that the sequence [ŋg] would have to appear domain-finally and is therefore realized as [ŋ]. In this case, the smallest domain phonology is applied to is apparently smaller than the whole phonological string. Kaye’s theory predicts that once phonology has been applied to the smallest phonological domain (here [*sing*]), the outcome [sɪŋ] is concatenated with all the possible parts of the phonological string within the next smallest domain, in our case, *sing* with *-er* ([sɪŋ]+[ə]). After this has been done, phonology is applied again. The sequence [ŋg] cannot be recovered, even though it would appear in domain-internal position, because it does not exist in the new structure at all. The proposed structure is then [*singer*]. (Why *-er* does not represent a separate domain will be made clear below.) Morphological structure is reflected in the phonology in this case, which means we are dealing with analytic morphology.

The pronunciation of *longer* [lɔŋgə] is similar to *finger* [fiŋgə]. Nothing in the phonology of *longer* suggests that the latter consists of more than one phonological domain; in terms of the pronunciation it behaves as a monomorphemic word. Nevertheless, it is clear from its morpho-syntactic characteristics that *longer*, being the comparative degree of *long*, is morphologically complex. This kind of morphology, which is not projected into phonology, is called non-analytic by Kaye. The proposed structure is then [long+er]: the two parts of a phonological string are concatenated prior to the application of phonology because they do not represent separate phonological domains.

In general, the theory assumes that morphology works cyclically. Each cycle consists of two steps. The first one is concatenation: all chunks of a phonological string that are submitted by morphology to phonology in this cycle are concatenated. The second step is application of phonology to the concatenated string. The ordering of cycles is such that the domain being worked on is always the smallest domain possible, i.e. it contains no other domains.

Kaye's model resembles the lexical phonology model in using cycle as its main derivational tool. However, it differs from it in two respects. Firstly, it rejects different levels of phonological derivations. Secondly, there is no re-ordering within the part of the cycle when phonology is applied. The minimalist hypothesis says that "processes apply whenever the conditions that trigger them are satisfied" (Kaye 1995: 291). It is crucial for Kaye's theory of the morphology-phonology interface that despite the fact that phonology is applied cyclically, the phonology itself is not cyclical. Rather, it is always the same mechanism applying to different sizes of phonological strings resulting in phenomena which can be direct consequences of the above-mentioned minimalist hypothesis.

For Kaye (1995), one of the main indicators of domainhood is stress. He assumes different structures for *superman* and *postman* on the basis of stress. In Southern British English the former word, *superman*, has two parts containing a stressed position, namely *super* and *man*, which is indicative of both parts being a separate domain. The proposed morphological structure is [[super][man]]. On the other hand, *postman* only has one stressed position, namely *post*, thus the proposed structure is [[post]man], the second part not representing a separate domain. For the same reason, *-er* in *singer* above was not assigned a separate domain.

#### 4. Theoretical background

In order to be able to fully understand the workings of phonology when analysing obstruent devoicing in Slovene we need to briefly review some basic

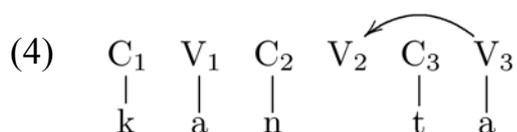
principles of Government Phonology (Strict CV approach): Coda Mirror (Scheer 2004), Coda Mirror Plus (Szigetvári 1999).

A phonological string consists of a series of positions which are of two types: C and V. The former type roughly corresponds to consonants and the latter to vowels. These two types of positions have to alternate in a phonological string. A C starts a phonological string and a V finishes it. A set of items that determine pronunciation is attached to the positions in an autosegmental fashion (see Goldsmith 1979). These items are called elements. The theory uses only a small number of elements, and the most radical versions recognize only six, namely A, I, U, H, L, and ? (glottal stop); for discussion see Rennison and Neubarth (2003) and Neubarth and Rennison (2005).

The strict CV approach allows a position to remain inaudible under certain conditions. The first condition is that the position is empty, i.e. without melodic material. A position C may remain inaudible any time it is empty. The distribution of inaudible V, on the other hand, is constrained by the Empty Category Principle (ECP), which can be satisfied in three different ways described below. If the ECP is not met, a V position becomes audible.<sup>3</sup>

#### 4.1. Government

Although a Slovene word like *kanta* ‘a bin’ lacks an audible vowel between *n* and *t*, in GP its structure consists of three CV pairs as shown in (4).<sup>4</sup>



Since position V<sub>2</sub> is inaudible, it has to satisfy the ECP. A way of satisfying it is by being the target in the governing relation (or government) with the following V. We can say that position V<sub>3</sub> governs position V<sub>2</sub> and thus allows it to remain inaudible (the governing relation is marked by a single arrow). Government is assumed to be a right-to-left relation, which means that the source of government follows its target in the phonological string. The relation is local, which means that there may be no intervening V between the two V positions in a governing relation.<sup>5</sup> The source of government must not be

3 In most cases it will be realized as a schwa (see Rennison and Neubarth 2003: 16).

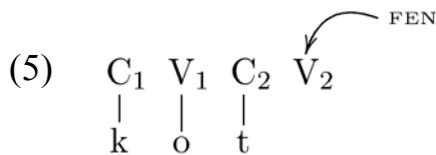
4 Throughout the paper only the phonological relations relevant to the discussion will be indicated in the linguistic examples. IPA characters in the figures showing phonological representations stand for an informal summary of the melodic elements attached to a particular skeletal position.

5 For fuller definitions of government see Kaye (2001) or Neubarth and Rennison (2005).

governed and the target of government must be an empty position. Taking into account these conditions, the only candidate for government in *kanta* is  $V_2$ .

#### 4.2. Final empty nucleus

Due to the directionality of government, the final empty nucleus cannot be governed. This leads us to propose a second way of satisfying the ECP. Final Vs in a phonological domain are allowed to remain inaudible according to the (parameterized) Final Empty Nucleus (FEN) Principle, as in *kot* ‘an angle’, (5).



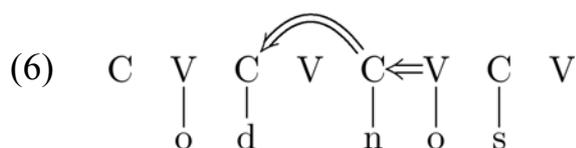
Whether these types of nuclei occur in a particular language, and whether they may license (see below) and/or govern is a parameter setting in the language. In Slovene they can occur, but they do not seem to be able to act as either governors or licensors.

#### 4.3. Licensing

It is assumed that a licensing relation “comforts the segmental expression of its target” (Ségéral and Scheer 1999: 20), which means that it is more likely for an unlicensed position to lose its melodic material. One of the most typical places where we witness the loss of material is the end of the phonological domain. (More on lenition in unlicensed skeletal positions in Ségéral and Scheer 1999.)

Licensing is also a right-to-left relation and can be found between a V and its preceding C, a V and its preceding V, or a C and its preceding C. For purposes of the present paper it will suffice to have a look only at relations in which a C position is targeted (the licensing relation in (6) is marked with a double arrow). Every full position V may license its preceding C. On the other hand, conditions determining whether a C position may license the preceding C are not so clear. For the purposes of this paper, I will assume that only sonorants can license and only obstruents can be licensed.<sup>6</sup> In addition, a C licenser must be licensed itself. I will assume that a C-to-C relation (in Slovene) will be established whenever these conditions are met.

6 There is substantial variation in the literature concerning licensing conditions. The core intuition seems to be that the licenser must be more complex than the licensee in some sense or other (see Scheer 1996 and Harris 1994:170, among others).

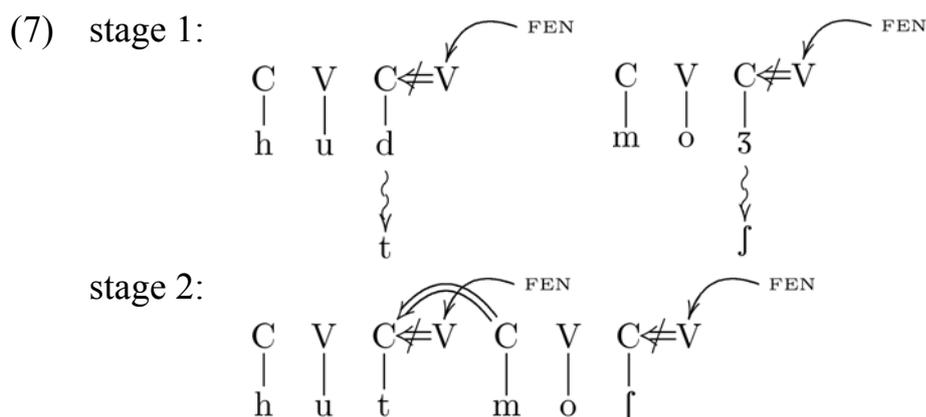


## 5. The analysis

Following Kaye, I take stress to be symptomatic of domainhood. Both words in *hud mož* [hut moʃ] ‘an angry man’ and *hud oče* [hut oʃe] ‘an angry father’ are full lexical words and each bears its own stress, therefore we can assume that each of them represents a phonological domain, namely  $[[húd][móz]]$  (shown in (7)) and  $[[húd][óče]]$ , which is indicative of analytic morphology.<sup>7</sup>

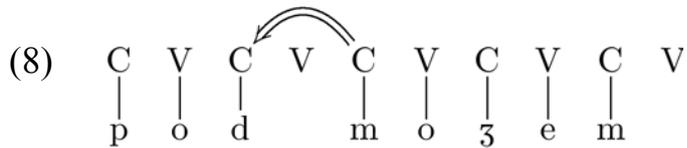
Prepositional phrases like *pod možem* [podmoʒem] ‘under (the) man’, (8), and *pod očetom* [podotʃetom] ‘under (the) father’, on the other hand, show only one stressed position, so the assumption will be that phonology is applied to one single piece of phonological string, which is indicative of non-analytic morphology:  $[pod+móžem]$  and  $[pod+očétom]$ .

This explains the obstruent devoicing facts. Due to the unlicensed status of their skeletal position both final obstruents in *hud mož* lose a part of their melodic material that encodes voicing in obstruents, that is the element L (for a similar phenomenon in German, see Brockhaus 1995). In the second stage the two parts are concatenated and a licensing relation is established; however, the melodic material that has been lost cannot be recovered. This is in accordance with one of the theory's main principles that elements cannot be called forth if their source is not locally present.



7 Since the same phonological domain structure is proposed for *hud mož* and *superman*, it might appear as if I am claiming that a noun phrase like *hud mož* functions as a compound. This is not the case. Here phonology is applied more than once: first on the inner domains and then on the outer domain (see (10)). Discussion of the possible size of the outer domain is beyond the scope of this paper.

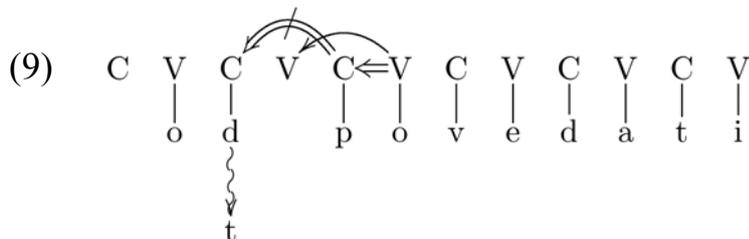
The final obstruent in the preposition *pod* ‘under’, which appears in the position licensed by the following sonorant or vocalic position, does not undergo devoicing. By virtue of being licensed it does not lose its melodic material.



Note that it is possible for a preposition to undergo devoicing when it does not immediately precede its complement as in *pred in za vlakom* [pret in za vlakom] ‘in front of and behind (the) train’ or if a preposition is contrastively stressed. This shows that the absence of devoicing is not an idiosyncratic property of a certain word class (like prepositions) but indeed depends solely on the phonological status of a skeletal position in question.<sup>8</sup>

Non-analytic morphology should not be confused with lexical storage. I would not like to argue that prepositional phrases are stored in the lexicon due to their non-analytic morphological nature, but rather that there are no phonological cues for their morphological analysis. This should be completely independent of their syntactic structure.

So far we have seen that the occurrence of a phonological process that applies in an unlicensed skeletal position can be morphologically conditioned. Let us recall that GP demands that morphological information be represented by domestic phonological objects. The obvious question that arises now is whether unlicensed (obstruent) positions appear only at (phonologically visible) morpheme boundaries. The answer is: no. They appear whenever there is no source for a licensing relation, which can be anywhere in a given phonological string. All unlicensed positions, regardless of their origin, are normally sites of lenition and are likely to lose melodic material in the same way; compare the origin of surface [t] in *hud* [hut] in (7) and *odpovedati* [otpovedati] ‘to cancel’ in (9). (Recall that sources of a licensing relation in Slovene can be sonorants and vowels, (6), but never obstruents.)



8 There are indeed secondary prepositions in Slovene that always undergo devoicing, but they are formed by conversion from other grammatical categories. This paper deals only with the so-called primary prepositions.

Since unlicensed positions are phonological objects that exist independently of morphological intervention it is expected that they behave uniformly across the language. It has been argued on the basis of stress that in Slovene prepositions do not represent phonological domains on their own, and therefore their final obstruents (before sonorants or vowels) are not in unlicensed positions. Quite the opposite holds for content words. If all unlicensed positions in the language are to behave in the same way it follows that there cannot be a situation with prepositions undergoing devoicing and content words not (with all other conditions unchanged).

## 6. A counterexample to analytic morphology?

When the next word begins with a voiced obstruent, domain final obstruent devoicing seems not to apply. This phenomenon can be explained by looking at cases in which a voiceless obstruent becomes voiced if followed by a voiced obstruent; consider the examples in (10):

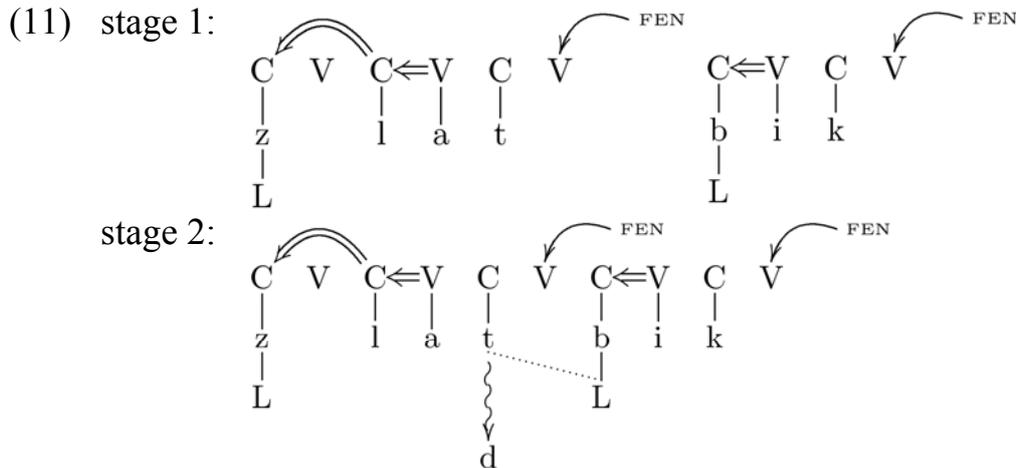
- (10) [mlat pəs]        *mlad pes* ‘young dog’  
       [mlad bik]        *mlad bik* ‘young bull’  
       [mlat muts]       *mlad muc* ‘young cat’  
       [tʃudovit pəs]    *čudovit pes* ‘wonderful dog’  
       [tʃudovid bik]    *čudovit bik* ‘wonderful bull’  
       [tʃudovit muts]   *čudovit muc* ‘wonderful cat’

Each word carries stress, therefore we assume that each is a separate phonological domain. However, the unlicensed obstruents in [mlad bik] and [tʃudovid bik] do not show the expected results: the former fails to undergo devoicing (compare *hud mož* [hut moʃ] above), while the latter, being originally voiceless, becomes voiced. Such anomalies seem to occur only before voiced obstruents.

GP accounts for these facts by arguing that the only difference between voiced and voiceless obstruents is that the former contain the element L as part of their melodic structure while the latter do not. If they acquire the element L in the course of the derivation, they surface as voiced obstruents. In turn, the voicing of sonorants and vowels does not need to be accounted for by reference to the element L, because in their case the voiced variant is the normal one. GP concludes they are inherently or “spontaneously voiced” (Harris 1994: 135).

Cases where domain final obstruent devoicing seems to fail are in fact instances of another process obscuring the effect of devoicing. This kind of a process is usually referred to as voice assimilation. I view voice assimilation as spreading and consequently sharing certain parts of melodic material, in the

Slovene case the element L, (11). We observe that spreading of the voicing element, L, is blocked by vowels and sonorants, but can affect whole uninterrupted sequences of obstruents regardless of the morphological complexity of the phonological string as in *riž z banano* [riʒ zbanano] ‘rice with banana’ as opposed to *riž s papajo* [riʃ spapajo] ‘rice with papaya’.



The direction of spreading is from right to left. Obstruents that acquire L in this process may have been originally voiced but have lost the element due to the unlicensed status of their skeletal position in the first cycle of the application of phonology. For this reason it seems that they have not undergone any changes. At this point an additional assumption has to be made, namely, that melodic sharing backs up the unlicensed position in a way similar to the way a licensing relation would and thus prevents it from losing melodic material. This is not an unnatural stipulation and may be compared to the widely accepted integrity of geminates (cf. for example, Kenstowicz 1994: 410–16).

## 7. Concluding remarks

In this paper I have analysed obstruent devoicing in Slovene within the phonological framework of Government Phonology (Strict CV; Coda Mirror and Coda Mirror Plus approach). Devoicing is viewed as loss of melodic material in unlicensed positions. Certain instances of the absence vs. the presence of devoicing before sonorants indicate that the process is morphologically conditioned: devoicing occurs word-finally in words belonging to major categories but not in prepositions.

The phonology-morphology interface theory used in the analysis is Kaye (1995), which claims that morphology only selects strings (phonological domains) to which phonology is applied simultaneously. I have argued that a preposition in Slovene does not constitute a phonological domain on its own, there-

fore its final obstruent position is not domain-final and receives support from the following sonorant position. This means the position is licensed and will not lose melodic material. On the other hand, words belonging to major categories are phonological domains on their own, therefore their final obstruents appear in unlicensed positions, which in Slovene lose the voicing element, L.

The analysis has shown that devoicing or its absence is thus totally predictable from the phonology itself, without any need for reference to non-phonological (i.e. morphological) objects. At the same time, a situation where devoicing would apply in prepositions but not in full lexical words cannot be predicted by the theory.

Cases where voiced obstruents preceding other voiced obstruents do not seem to undergo devoicing are no exceptions; all obstruents in a given environment undergo devoicing. However, the effect of devoicing can sometimes be obscured by another process, called voice assimilation, which in the given theoretical framework means spreading of the element L into adjacent obstruent positions.

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## **Deriving Discontinuity\***

### **1. Introduction**

This paper is partly born of an increasing sense of uncertainty about how to do syntax. Time was, we linguists had at our disposal a generally accepted arsenal of analytic devices to deal with a familiar range of constructions and phenomena. However, as the phenomena under study began to proliferate, so did the analyses. The increasingly baroque GB architecture began to collapse under the weight of Japanese, but it was the vagaries of Slavic that surely “brought the house down”. Now, one might think that Minimalism—with its appeal to elegance and its purported aim of narrowing the search space for credible hypotheses to those that stray as little as possible from “virtual conceptual necessity”—would at the very least provide us with a general blueprint for how to construct the right sort of analysis for any given problem. Unfortunately, it does not seem to me that we are there yet. The leading ideas are broad, expansive, and on occasion even profound, but actually applying them to real linguistic data can be a very frustrating exercise.

### **2. Clitics Split Phrases**

The present paper is a case in point. Initially, I set out to study the phenomenon of splitting of nominal expressions by clitics in the Croatian idiolect of my Croatian colleague Anita Peti-Stantić. My expectation was that there would be nothing special to say about clitics inside nominal expressions. That is, the by now traditional wisdom is that splitting by clitics does *not* involve PF-side placement of the clitics internal to the nominal expression, but is rather parasitic on more generally available processes that somehow “scramble” pieces of NPs. Thus, when clitics appear to interrupt, the clitics are really where they always are (wherever that is) and it is the pieces of the NPs that have done something unexpected. So, following this widely adopted claim,<sup>1</sup> one should *not* treat clitic

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\* The FDSL version of this paper was a joint effort with Anita Peti-Stantić, presented under the title “Splitting Puzzles in South Slavic”. This written version reflects extensive discussion with her of the Croatian data reported herein. I am extremely grateful for her thoughtful judgments, invaluable insights, and helpful suggestions.

1 This claim, so far as I know, was first made in Franks and Progovac (1994) but has since been reiterated in various places and has been expanded upon in Bošković’s work (especially Bošković 2001).

splitting data separately from splitting by other, fully lexical elements. Peti-Stantić (in press), for example, cites the Croatian examples in (1), where clitics split, and compares these to the corresponding examples in (2), where the intervening material is lexical:<sup>2</sup>

- (1) a. *Sestrina mi prijateljica sutra dolazi u posjet.*  
 ‘Sister’s friend is coming to visit me tomorrow.’  
 b. *Ivana **sam** Ivića upozнала prije mjesec dana.*  
 ‘I met Ivan Ivić a month ago.’  
 c. *O izuzetno **smo** zanimljivoj knjizi razgovarali.*  
 ‘We were talking about an especially interesting book.’  
 d. *Studenticu **mi je** teorijske fizike predstavio.*  
 ‘He introduced a student of theoretical physics to me.’
- (2) a. *Sestrina sutra dolazi prijateljica. (a ne neka druga)*  
 ‘It is SISTER’S friend who is coming tomorrow.’  
 (and not some other one)  
 b. *Odavno već Ivana čitaju Ivića. (a ne nekog drugog Ivića)*  
 ‘They have been reading IVAN Ivić for a long time.’  
 (and not some other Ivić)  
 c. *O izuzetno **razgovaramo** zanimljivoj knjizi.*  
 (a ne tek donekle zanimljivoj)  
 ‘We are talking about an ESPECIALLY interesting book.’  
 (and not just a moderately interesting one)  
 d. *Studentica **dolazi** teorijske fizike. (a ne studentica povijesti)*  
 ‘A student OF THEORETICAL PHYSICS is coming.’  
 (and not a student of history)

While one could imagine a so-called “Prosodic Inversion” account of (1a), whereby the clitic *mi* is left in initial position by the syntax, i.e., in front of *sestrina prijateljica*, and then undergoes a PF process so that it would be pronounced at the right edge of the first prosodic word, producing *sestrina mi prijateljica*, prosodically motivated movement is surely ludicrous for (2a). Here, not only is *sestrina prijateljica* separated by tonic material which would be perfectly happy wherever the syntax left it, but that material—*sutra dolazi*—is not even a constituent. Instead, *sutra* and *dolazi* are wherever they are and the pieces *sestra* and *prijateljica* for some reason end up being pronounced in a way that flanks *sutra* and *dolazi*. By Occam’s Razor, I eschew Prosodic Inversion and apply the same reasoning to (1a).

2 For ease of reference, split constituents are underlined and splitting material is in boldface.

### 3. Does Splitting Reflect Focus?

It is noteworthy that, in offering the examples in (2), Peti-Stantić felt the need to add a parenthetical highlighting the contrastive focus nature of the construction. This makes sense, as scrambling in Slavic is by no means semantically vacuous, but rather reflects the exigencies of Functional Sentence Perspective. In (2a–c) it is the element that immediately precedes the splitting material that is focused (*sestrina*, *Ivana*, and *izuzetno*, respectively), but this does not seem to be a requirement, since in (2d) it is what follows, namely *teorijske fizike*, that bears contrastive focus. More generally, her judgments are that one or the other side must be focused, so that in (2d) it could instead be *studentica* that is contrastively focused and in (2a–c), respectively, it could instead be *prijateljica*, *Ivića*, or *zanimljivoj*.

However we ultimately implement this splitting, the following question arises: Given that the splitting examples in (2) require contrastive focus to be felicitous, is the same true of (1)? According to the translations in Progovac (2006) for the Serbian data in (3) and (4), this seems to be the case:

- (3) *Vukina se ćerka udala.*  
‘It was VUKA’s daughter who got married.’
- (4) *Vukina odlazi ćerka.*  
‘It is VUKA’s daughter who is leaving.’

These can presumably be opposed to examples with the subject NP *Vukina ćerka* intact, as in (5), which involve no special discourse presuppositions and are completely stylistically neutral:

- (5) a. *Vukina ćerka se udala.*  
‘Vuka’s daughter got married.’
- b. *Vukina ćerka odlazi.*  
‘Vuka’s daughter is leaving.’

Peti-Stantić points out, however, a contrast between (3) and (4): whereas the former can be understood as perfectly neutral and does not necessarily require focus, in (4) either *Vukina* or *ćerka* must be focused. These judgments are reflected in the additional translations provided in (3’) and (4’):

- (3’) *Vukina se ćerka udala.*  
‘It was Vuka’s DAUGHTER who got married.’ AND ALSO ...  
‘Vuka’s daughter got married.’

(4') *Vukina odlazi ćerka.*

'It is Vuka's DAUGHTER who is leaving.' BUT NOT ...

\*'Vuka's daughter is leaving.'

This difference might be taken to suggest that, although (3) and (4) both look like left-branch extraction (LBE), we are not in fact dealing with a monolithic phenomenon.

There are, on the other hand, many reasons to want to analyze splitting by clitics as a subcase of the more general case, with differences in preferred interpretations following from independent considerations. There is a high degree of variation in judgments about the acceptability of different kinds of splitting, both across speakers and across languages. Nonetheless, if splitting by clitics is indeed parasitic on splitting in general, then we would predict that the felicity of splitting should be comparable, again both across speakers and across languages, regardless of whether the splitter is a clitic or a tonic element. This expectation is borne out by the Slovenian data in (6), which are the Slovenian versions of Serbian (3) and (4):

- (6) a. ?\**Vukina se je hči poročila.* (cf. ✓*Vukina hči se je poročila.*)  
 b. ?\**Vukina odhaja hči.* (cf. ✓*Vukina hči odhaja.*)

The fact that neither (6a) nor (6b) is particularly felicitous (in normal styles) confirms our expectation that these should be disallowed or favored to a similar extent, *modulo* independent considerations. For example, since in Bulgarian pronominal and verbal auxiliary clitics are adjacent to the verb, these can never split NPs, even to the extremely limited extent that extraneous material can ever interrupt the adjective noun sequence in those languages.<sup>3</sup>

There exists a burgeoning literature on splitting in languages like Russian and German, and even a cursory examination of this literature reveals a considerable amount of disagreement over data. My informal queries about South Slavic suggest a range of latitude in acceptability of splitting here too. Some speakers of languages that basically lack this, such as Slovenian, Macedonian, and Bulgarian, will still accept splitting in "poetic" styles or in discourse contexts where the appeal to contrastive focus might be greatest. On the other hand, some speakers of languages like Serbian and Croatian, which basically have splitting, seem to accept it very broadly in these contexts. Peti-Stantić is one such speaker: she admits splits that have elsewhere been deemed

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3 The interrogative clitic *li* works differently, as shown in examples (26) and (27).

impossible.<sup>4</sup> Be that as it may, what I have in general found, comparing Croatian sentences where clitics can split phrases with those which are as minimally different as we could construct but with something other than a clitic doing the splitting, is that, if there is a difference, the sentence where a non-clitic splits might be degraded with respect to the one where a clitic splits. Consider, for example, (7b) versus (7c):

- (7) a. *Sestra i njen muž će mi ga pokloniti.* [no splitting]  
 ‘Sister and her husband will give it to me.’
- b. ✓ *Sestra će mi ga i njen muž pokloniti.*  
 ‘It is SISTER and her husband who will give it to me.’
- c. ?? *Sestra rado i njen muž poklanjaju knjige školskoj knjižnici.*  
 ‘It is SISTER and her husband who gladly give books to the school library.’
- d. ✓ *Sestra će i njen muž doći u utorak.*  
 ‘It is SISTER and her husband who will come on Tuesday.’

Although (7b) is the sort of thing, with multiple clitics splitting a coordinated NP, that ever since the seminal work of Browne (1975) has been cited as unacceptable (cf. e.g. Schütze 1994, Progovac 1996, Franks and King 2000), Peti-Stantić and other Croats I have polled find it perfectly fine.<sup>5</sup> Putting aside the (very interesting) questions this variation raises, my point is simply that, to reiterate, whenever there is a difference, it is the sentence where a non-clitic splits that will be worse than the one where just a clitic splits. It seems to me that the proper way to interpret these facts is as a matter of degree. This contrast, I believe, corresponds to the difference in how much splitting necessarily reflects focus, where, on the whole, a contrastive focus reading is far more expected when non-clitics split than when clitics do. This fact, although it does not necessarily imply distinct mechanisms for splitting phrases, should tell us something about the design and operation of the mechanisms for deriving splitting. I now turn to a survey of those mechanisms.

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4 Whether this reflects a change in progress, is a matter of dialectal or idiolectal variation, or is simply a difference in how judgments are assessed and reported should be the subject of a different, more sociolinguistically oriented study than this one.

5 More to the point, they do not rate (7b) worse than (7d), with only one clitic; if anything, such Croatian speakers find it much better; Progovac (1996) on the other hand reports a clear contrast in her Serbian, with (7d) marginal and (7b) outright ungrammatical.

#### 4. An Abundance of Mechanisms

Just as different languages, and speakers of those languages, vary in their tolerance for splitting, so does there exist an abundance of technical ways one might obtain splitting.<sup>6</sup>

##### 4.1. PF–Side Placement

For clitic splitting, as mentioned, one possibility is literal PF–side placement, with at least the two conceptual variants in (8).

- (8) a. **Move** prosodically unsupported enclitics to the edge of an adjacent P-word. OR ...  
 b. **Linearize** clitics at the prosodically appropriate edge of an adjacent P-word.

Choice between these variants depends on whether or not linear order is imposed in the syntax, before material is shipped off to PF. Either way, and independently of the additional problems (8) raises, it is simply not possible to generalize such Prosodic Inversion approaches to splitting by tonic material, as in (2). Nor is (8) likely to accommodate the sort of splitting in (9), based on (7) and also judged perfectly felicitous by Peti-Stantić, since this appears not to target the first prosodic word (i.e., *moja*):

- (9) *Moja sestra su mi ga i njen muž poklonili.*  
 ‘It is my SISTER and her husband who gave it to me.’

This same pattern of possibilities is given in (10), where the split NP is contained within a PP:

- (10) a. *U izuzetno veliku sobu sam ušao.* [no splitting]  
 ‘I entered an exceptionally large room.’  
 b. *U izuzetno sam veliku sobu ušao.*  
 ‘It was an exceptionally large room that I entered.’ AND ALSO ...  
 ‘It was an EXCEPTIONALLY large room that I entered.’

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6 I cannot do justice to them all here. For Russian, an overview of the possibilities which in many ways resembles my own survey can be found in Pereltsvaig (in press). Space limitations unfortunately prevent a comparison of our conclusions. I also refer you to Bošković (2005) for discussion in particular of LBE.

- c. *U izuzetno veliku sam sobu ušao.*  
 ‘It was an exceptionally large room that I entered.’ AND ALSO ...  
 ‘It was an exceptionally LARGE room that I entered.’

(10c), like (9), cannot be handled by anything like the systems in (8). Of course, this does not mean we can be sure that something like (8) does not exist, but rather that, even if it does derive some instances of superficial splitting in some languages, we are still going to need other mechanisms that operate in the syntax proper, mechanisms that will, in fact, handle most of the cases. (Indeed, any element that splits that is not prosodically *enclitic* is not even a candidate, thus ruling (8) out for Slovenian, for example, and for everything but *li* in Bulgarian, let alone Macedonian.) Fortunately (or perhaps not!) alternatives to (8) abound, each entailing its own set of assumptions.

#### 4.2. Left-Branch Extraction

The first and most familiar way of deriving ostensible splitting is LBE. Under this account, the sentence in (4) can be schematized as in (11).

- (11) a. [<sub>AP</sub> Vukina<sub>i</sub>] odlazi [<sub>NP</sub> *t<sub>i</sub>* ćerka].  
 b. [<sub>AP</sub> Vukina] odlazi [<sub>NP</sub> [<sub>AP</sub> ~~Vukina~~] ćerka]

This just involves movement, represented as in (11a) or, using the Copy-and-Delete system, as in (11b); note that (11) requires the NP-over-AP structure for nominal expressions, rather than Abney’s DP-over-AP-over-NP one. Bošković (2005) considers LBE in depth, reviewing a range of approaches from the perspective of why some languages tolerate it and others do not. His paper puts forward two robust correlations: (i) LBE is disallowed in DP languages and (ii) LBE presupposes the possibility of scrambling. This is part of Bošković’s general scheme, according to which nominal expressions project up to DP only in some languages, whereas in others the projection stops at NP. So, for example, Bulgarian (and Macedonian) differ from the other Slavic languages in having a DP, as indicated by the definite article *-ta* in Bulgarian (12a), and eschew LBE splitting, as shown in (12b):

- (12) a. Petko prodade [<sub>DP</sub> [<sub>AP</sub> novata [<sub>NP</sub> kola]]  
 ‘Petko sold the new car’  
 b. \* [<sub>AP</sub> Novata] prodade Petko [<sub>DP</sub> [<sub>AP</sub> ~~novata~~ [<sub>NP</sub> kola]]]?  
 ‘It was the NEW car that Petko sold.’ [Intended]

Similarly, word order in Bulgarian, although far from completely fixed, is not nearly as free as in the other languages; it is more on the lines of German. Bošković (2005) considers various ways to derive the impossibility of LBE in (12b) from the idea that Bulgarian nominal expressions are DPs, roughly as indicated in (12b), which assumes an Abney type DP-over-AP-over-NP analysis, so that there simply is no left-branch AP to extract. This contrasts with felicitous Serbian (11b), with the alternative nominal structure in which AP is contained within NP.

Bošković (2006) adduces several additional candidate correlations, buttressing his idea that the traditional noun phrase masks (at least) two types of phrases and that a host of differences between languages in some way or other might derive from this typology.<sup>7</sup> Turning in this light to the difference noted earlier between Serbian or Croatian and Slovenian, one would be forced to conclude that modern, colloquial Slovenian, which arguably lacks LBE, must somehow have adopted a DP, presumably under German influence. I realize this is a somewhat contentious claim since, as an anonymous FDSL referee pointed out, “overtly the DPs in the two languages aren’t that different.” I would nonetheless argue that, if indeed Slovenian lacks LBE, Bošković’s analysis leads to the conclusion that Slovenian projects to DP, *even if D<sup>0</sup> itself remains empty*. Bulgarian and Macedonian, after all, do not actually have anything overt in D<sup>0</sup>, definiteness being marked inflectionally on the head below DP, but there is still a DP, with specificity features, and it is this that presumably gives rise to the pattern of effects discussed by Bošković.<sup>8</sup>

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7 I tend to doubt that the nominal world could be as simple as NP vs. DP, since in particular I have argued elsewhere that some nominal expressions in Russian are maximally QPs and that the Slavic pronominal clitics are heads of KPs. Yet the strength of Bošković’s correlations, it seems to me, cannot be denied. If they are correct, one might want to characterize the primary contrast in terms of whether or not definiteness and specificity features are introduced on a distinct functional head (i.e., a DP).

8 Possible evidence for DP within Slovenian, however, might be the invariant colloquial *ta* described by Marušič and Žaucer (2006). Colloquial Slovenian may be something like colloquial Finnish, which according to Ritva Laury (1997 and personal communication) has also recently taken on a new definite article, *se*, as in (ii):

- (i) *Punaisen ostin auton.* [literary Finnish, poetic style]  
 red-acc buy-pst-1sg car-acc
- (ii) *?\*Punaisen ostin (sen) auton.* [spoken Finnish]  
 red-acc buy-pst-1sg the-acc car-acc

Platzack (2006) has recently argued for such a reanalysis in the history of Icelandic. He notes that DP also arose in other Scandinavian languages, suggesting a concomitant switch from NP-over-AP to AP-over-NP. This seems to be an area phenomenon; cf. also North Russian.

### 4.3. Base Generation + LF Composition

Other factors of course come into play, particularly morphological richness. For example, in Warlpiri, discontinuous constituents invoke multiple morphological marking, as can be seen in (13), from Hale (1973):

- (13) a. Tjantu wiri -*ŋki* = *tji* yalku -*nu*.  
 dog big erg 1sg.obj bite past  
 ‘The big dog bit me.’
- b. Tjantu -*ŋku* = *tju* yalku -*nu* wiri -*ŋki*.  
 dog erg 1sg.obj bite past big erg
- c. Wiri -*ŋki* = *tji* yalku -*nu* tjantu -*ŋku*.  
 big erg 1sg.obj bite past dog erg

Significantly, there is a sense in which each piece acts independently: curiously not unlike Croatian or Serbian, the Warlpiri object clitic goes after the first constituent, which is just the noun in (13b) and just the adjective in (13c).<sup>9</sup> So perhaps, at least in a language with great freedom of word order like Warlpiri, the scrambled pieces are base generated separately and composed only in LF.<sup>10</sup> If adapted to the Serbian sentence in (4), then something like (14) would be all that the syntax provides:

- (14) [<sub>AP</sub> Vukina] odlazi [<sub>NP</sub> ćerka].

Closer to home, one might wonder why German should allow splitting, as discussed in Fanselow and Čavar (2002), when Dutch does not, if not for differences in nominal morphology. However, in Bošković’s system neither language has true LBE, since both are DP languages. That is, if the tradition stemming from Uriagereka (1988) and Corver (1992) is right, splitting in German (15) *cannot* be analyzed as LBE:

- (15) a. Wieviel hat er Bücher gelesen?  
 ‘How many books has he read?’
- b. Bücher hat er keine gelesen. (BUT \*Keine hat er Bücher gelesen.)  
 ‘As for books, he has read none.’
- c. Bücher hat man interessante in den Osten keine mitnehmen dürfen.  
 ‘As for books, one could not take any interesting ones to the East.’

9 Note that the form of the second position clitic, *tji* or *tju*, reflects the same word level vowel harmony as the repeated ergative case marker *ŋki* or *ŋku*.

10 This could be implemented along the LF-lowering lines of Bošković & Takahashi (1998), raising however non-trivial questions about the role of case features on the LF-side.

It is worth noting that in German, like Warlpiri, the pieces inflect like independent DPs so that, in (16b), the strong form *deutsche* reemerges:

- (16) a. *Er hat keine deutschen Bücher gelesen.*  
 ‘He has read no German books.’  
 b. *Deutsche Bücher hat er keine gelesen.*  
 ‘As for German books, he hasn’t read any.’

Facts such as these are problematic for LBE and might suggest a base generation account. Croatian splitting examples as in (7), (9), and (10) also present problems for simple left-branch AP extraction.

#### 4.4. Remnant Movement

Another at one time popular kind of derivation involves remnant movement, schematized for the same Serbian example in (17).

- (17) a. [<sub>AP/DP/KP</sub> Vukina *t<sub>i</sub>*] odlazi [<sub>NP</sub> *ćerka<sub>i</sub>*].  
 b. [<sub>AP/DP/KP</sub> Vukina *ćerka*] odlazi [<sub>NP</sub> *ćerka*].

The remnant movement analysis, put forward for Serbian in Franks and Progovac (1994) *inter alia*, is more or less the opposite of LBE: in (17a), or Copy-and-Delete version (17b), the NP *ćerka* first extracts from some larger nominal domain,<sup>11</sup> before that larger remnant domain fronts, minus the extracted portion. Thus, whereas under the LBE account the lefthand portion of the split is expected to be a constituent, under the remnant movement account it is the righthand portion that should be a constituent. Thus, (9) or (10c) could be handled by moving *i njen muž* or the NP *sobu* out of their containing phrases, which then themselves front, roughly as in (18):

- (18) a. [Moja sestra ~~*i njen muž*~~] su mi ga [<sub>BP</sub> *i njen muž*] poklonili. [= (9)]  
 b. [U izuzetno veliku ~~*sobu*~~] sam [<sub>NP</sub> *sobu*] ušao. [= (10c)]

What then about (10b)? In Franks and Progovac (1994), in order to explain the contrast they report in Serbian (19), we argue that NP but not AP can extract from the remnant:<sup>12</sup>

- (19) a. [U izuzetno veliku ~~*sobu*~~] je Jovan ušao [<sub>NP</sub> *sobu*].  
 b.(\*)[U izuzetno veliku ~~*praznu sobu*~~] je Jovan ušao [<sub>AP</sub> *praznu sobu*].

11 To avoid commitment, I have labeled this domain as “AP/DP/KP.”

12 Note that this only works if, contra Bošković, one adopts the AP-over-NP structure.

Consider also (20a), from Bošković (2005):

- (20) a.(\*) *Visoke je on lijepo djevojke vidio.* [OK for some speakers]  
 ‘It was TALL beautiful girls that he saw.’  
 b.(\*) *Visoke lijepo je on djevojke vidio.* [OK for some speakers]  
 ‘It was tall BEAUTIFUL girls that he saw.’

While (20a) might be bad if AP cannot move out before remnant movement and *lijepo djevojke* is an AP, one wonders why (20b), with just NP moving out, is then no better. Returning to (10b), this idea becomes even more problematic, since—regardless of whether one adopts the NP-over-AP or AP-over-NP structure—*izuzetno* should be a constituent with *veliku*, which it modifies. We therefore suggested an LBE rather than remnant movement approach to examples like (10b), with the AdvP *izuzetno* fronting and the P *u* somehow attaching to the AdvP beforehand. So, even in that early paper, at least two mechanisms for splitting were called for!<sup>13</sup>

#### 4.5. Movement with Distributed Deletion

This brings me to our final mechanism, one in which the entire phrase moves but, in the spirit of Fanselow and Ćavar (2002), deletion of the phrase’s subparts is distributed (or “scattered”) across its various occurrences. This powerful mechanism is actually a second PF-side approach, but one (unlike PF movement) that capitalizes on an independently well-motivated aspect of the syntax–PF interface: in mapping from syntax into PF, decisions about which copies to pronounce and which to delete *must* be made. Returning to our example in (4), it is the nominal portion *ćerka* of the higher copy which, under distributed deletion, is left unpronounced. This is shown in (21).

- (21) [<sub>NP</sub> Vukina ~~ćerka~~] odlazi [<sub>NP</sub> ~~Vukina~~ ćerka].

Of course, the problem with such a system is constraining it. Nonetheless, while any of the methods considered might turn out to be viable for something like *Vukina odlazi ćerka*, it seems to me that—of the plethora of mechanisms countenanced by recent linguistic theory—distributed deletion is likely to be the best way to handle the striking types of splits which Peti-Stantić finds acceptable in her Croatian speech. So, looking back at (19b) and (20), it should be noted

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13 Bošković (2005) points out several additional technical problems with using remnant movement to handle splitting, which I will not reproduce here. Suffice it to say these problems are to some extent complementary to those arising under the LBE analysis, depending on constituency.

that the asterisks were placed in parentheses because, once again, for her these are perfectly felicitous with the material preceding the split focused. It thus may be that different speakers and/or different dialects vary in how liberally they implement distributed deletion and in how willing they are to tolerate its application, but beyond that, I have little to say about the discrepancies in reported judgments.

## 5. An Abundance of Judgments

Finally, consider some additional kinds of problems which the data present:

- (22) a. Splitting by clitics is less constrained (in occurrence and in need to impose a focus interpretation) than splitting by other material.  
 b. The pieces of the split need not be syntactic constituents.  
 c. Clitics can split even very low in the structure.

The first problem suggests some independent reason to expect clitic splitting to be less marked. This probably follows from the fact that there are always going to be copies above and below the clitics, if these move to a high head position whose Spec must be filled. With non-clitic material, on the other hand, movement more clearly reflects Functional Sentence Perspective considerations. The second problem suggests a PF-side approach to deletion. The third problem is unique to Peti-Stantić's data.

First, contrary to judgments reported elsewhere, many Croatian speakers judge to be perfect examples such as (7b) and (9), repeated in (23):

- (23) a. *Sestra će mi ga i njen muž pokloniti.*  
 'It is SISTER and her husband who will give it to me.'  
 b. *Moja sestra su mi ga i njen muž poklonili.*  
 'It is my SISTER and her husband who gave it to me.'

Syntactic accounts invoke constituency for movement; here, the separated pieces are indeed likely constituents. More problematic might be (24):

- (24) *Moja su mi ga sestra i njen muž poklonili.*  
 'It is MY sister and her husband who gave it to me.'

Under no syntactic analysis can *sestra i njen muž* be a constituent, since *moja* only scopes over *sestra*, so the remnant movement account is unlikely for (24). *Moja* could of course be targeted to move as a focus, although movement of *moja* alone might be a Coordinate Structure Constraint violation. Distributed

deletion however would work, provided that the material following the focus need not be a constituent. Note that even the preserved focused portion is not required to be a constituent, given (10b). My distributed deletion proposal would exploit the fact that there are copies above and below the clitics. If the high copy bears focus features, (10b) might look something like (25a). Similarly for (20b), which will look like (25b).<sup>14</sup>

- (25) a. [PP U [NP [AP izuzetno veliku] ~~sobu~~]] [**sam** [PP ~~u~~ [NP [AP ~~izuzetno~~  
[+Foc] veliku] sobu]]] ušao.  
b. [NP Visoke lijepe djevojke] **je on** [NP ~~visoke lijepe djevojke~~] vidio.  
[+Foc]

When an element in a phrase XP bears the focus feature, that phrase moves to SpecFP (or wherever [+Foc] is checked). The operative principle is now that there can be no material within the fronted phrase that is to the right of the element bearing the [+Foc] feature. All material following the [+Foc] element is thus marked for “flat” intonation and is subsequently deleted in the mapping to PF. This results in pronunciation of the next highest copy of that material. Crucially, as example (25a) shows most clearly, material on neither side of the [+Foc] element is required to be a constituent, a fact which is problematic for movement accounts: whatever happens to precedes [+Foc] in its phrase is retained and whatever follows it is deleted (giving rise to complementary deletion/pronunciation in the next copy down). Note that the kind of deletion operative here is *not* constrained by constituency (unlike under traditional notions of ellipsis); instead, all that matters is linear adjacency.

This account extends to the analysis of splitting by focus *li* in Bulgarian in Franks (2006), based on ideas in Lambova (2003), even though Bulgarian as a DP language disallows true LBE. Thus (26) can be derived as in (27):

- (26) a. Novata li knjiga na Ivan vidja?  
‘Was it the NEW book by Ivan that you saw?’  
b. Vtozi li grad si xodil?  
‘Have you been to THAT city?’
- (27) a. [Novata [~~knjiga na Ivan~~] **li** [~~novata~~ [knjiga na Ivan]]] vidja?  
[+Foc]  
b. [V [tozi grad]] **li** [~~v~~ [tozi grad]] si xodil?  
[+Foc]

14 When non-clitics intervene there is more complex structure between the deleted and pronounced portions than indicated in (25), a factor which I believe reduces the possibility of defocusing that seems to exist with clitics.

It seems that material within a maximal projection that comes after the focus is deleted, causing it to be pronounced in a lower copy. The result is then we believe filtered out on the PF side, with considerable variation across speakers and languages in what can be tolerated.

Peti-Stantić (in press), in examining whether spoken Croatian really adheres to second position for clitics, offers the examples in (28):

- (28) a. *Svakog ću lijepog dana putovati vlakom svojoj kući.*  
 ‘Every nice day I will go to my house by train.’  
 b. *Svakog lijepog ću dana putovati vlakom svojoj kući.*  
 c. *Svakog lijepog dana ću putovati vlakom svojoj kući.*  
 d. *Svakog lijepog dana putovat ću vlakom svojoj kući.*  
 e. *Svakog lijepog dana putovati vlakom ću svojoj kući.*  
 f. *Svakog lijepog dana putovati vlakom svojoj ću kući.*

Whereas Peti-Stantić judges (28a, c, d) as “absolutely neutral”, (28b) favors focus on *lijepog*, and the last two put some slight emphasis on the word immediately before (or after) the clitic.

It is not easy to know how to derive such a range of possibilities. In a series of works, Bošković and I capitalized on clitics themselves moving and argue that lower clitic copy pronunciation is sometimes necessitated for PF reasons. These reasons are basically lack of prosodic support, either because there is no host to the left of the enclitic or the host is not available because it is separated from the clitic by an intonational phrase boundary. So, at least for “clitic third” (28d), it may be that lower pronunciation is a PF phenomenon. Note, however, that since in none of these examples does Peti-Stantić claim to feel an intonation break, we may need to assume some degree of opacity in the derivation: the decision about what copy to pronounce is based on intonational information which may be subsequently erased (which makes some sense in that the position of the clitic renders it recoverable). On the other hand, having the clitic lower than immediately below the verb, as in (28e, f), is generally regarded as impossible; this is even true of English weak pronouns:

- (29) a. John threw out the books./John threw ’em out.  
 b. John threw the books out./\*John threw out ’em.

It is however worth noting that, for Peti-Stantić, Croatian (30) has exactly the same stylistic status as (28f):

- (30) *Svakog dana vlakom do svoje putujem kuće.*  
 ‘Every day I go to my HOUSE by train.’ OR  
 ‘Every day I go to MY house by train.’

These data thus reveal that clitics in Croatian seem to be pronounceable much lower than expected, although when that happens they are splitting just as tonic constituents do. So the first problem is getting the clitics below the verb: there should not even be a copy of *ću* that low in (28e) or (28f). I therefore conclude that (28e) and (28f) must derive from the syntactic structure in (31):

- (31) [Svakog dana putovati vlakom svojoj kući] **ću** [svakog dana putovati vlakom svojoj kući].

Distributed deletion then applies, depending upon where the focus is.

PP-internal splitting provides another interesting illustration of the same general principles. Consider the range of splits in (32), judgments and readings (in decreasing order of preference) again provided by Peti-Stantić:

- (32) a. *Od jučer ga prodaje za velike novce.* [no splitting; neutral reading]  
 ‘Since yesterday (s)he’s selling it for big bucks.’  
 b. *Za velike ga novce prodaje od jučer.* [neutral reading preferred]  
 ‘Since yesterday (s)he’s selling it for big bucks.’  
 c. *Od jučer prodaje za velike ga novce.*  
 ‘Since yesterday (s)he’s selling it for big BUCKS.’ OR  
 ‘Since yesterday (s)he’s selling it for BIG bucks.’ OR JUST  
 ‘Since yesterday (s)he’s selling it for big bucks.’  
 d. \* *Od jučer prodaje za ga velike novce.*

Although (32c) is quite unexpected under familiar models of clitic placement, if the entire clause is fronted past *ga*, it can be derived as in (33).

- (33) [Od jučer prodaje za velike ~~novce~~] **ga** [~~od jučer prodaje za velike novce~~]  
 [+Foc]

The variation in focus, that is, either before or after the split, raises an additional concern, since so far all I have said is that [+Focus] causes material following it to be deleted. In order to implement this variation, we need to admit the possibility that the [+Focus] feature can actually be marked on a *lower* copy. Compare (34) with the derivation in (33) of (32c):

- (34) [Od jučer prodaje za velike ~~novce~~] **ga** [~~od jučer prodaje za velike novce~~]  
[+Foc]

In (34), as opposed to (33), it is the lower instance of *novce* which is focused, hence must be pronounced. This forces the higher copy of *novce* to remain silent. However, the material preceding it—*od jučer prodaje za velike*—is pronounced, following the general principle that higher copies are pronounced so long as they do not violate PF requirements. This causes the lower instance of *od jučer prodaje za velike* to be deleted.

Finally, what about (32d), in which the clitic cannot go immediately after the preposition? The source of the largely universal cohesion between preposition and complement is a widely researched topic, about which I will have little to say. However, if I am correct that whatever is going on here is a matter of PF-side deletion, one wonders why syntax should be relevant at all. And indeed, it seems as though on some level (32d) must be rejected out of PF considerations. The reason is that when such splittings involve a preposition that has an adverbial (i.e., intransitive) variant, the splitting is not in fact filtered out by PF. Consider (35) and (36):

- (35) a. *Ispred **ga je** ulaza dočekala policija.*  
‘The police were waiting for him in front of the exit.’  
b. *Pored **je** tog čovjeka sjela.*  
‘She sat next to that man.’  
(36) a. *On je sjedio ispred/pored.*  
‘He was sitting in front/right by.’  
b. *Ispred/Pored je sjedio.*

Prepositions that do not admit intransitive usage, such as *prema* in (37), invariably block splitting:

- (37) a. \**Prema **je** tom čovjeku došao.*  
‘He came towards that person.’  
[cf. *Prema tom čovjeku **je** došao.* OR *Prema tom **je** čovjeku došao.*]  
b. \**Išao je prema.*  
[Intended: ‘He was going towards.’]

If this is correct, the deletions in (38a) are valid but the ones in (38b) are not:

- (38) a. [Pored ~~tog čovjeka~~] **je** [~~pored tog čovjeka~~] ...  
b. \**[Prema ~~tom čovjeku~~] **je** [~~prema tom čovjeku~~] ...*

PF-side deletion can create both, but (38b) is filtered out whereas (38a) is not. In general, my survey of prepositions shows that they fall into two classes along precisely these lines: splittability is enabled by potential (although not actual!) intransitivity. The correlation raises many interesting questions about access to the Lexicon and the Syntax–PF interface which, unfortunately, must belong to a different study.

## 6. Conclusion

Recent linguistic theory countenances a superfluity of mechanisms for generating discontinuous constituents. These include PF mechanisms of linearization and deletion, syntactic mechanisms of movement either of the left-branch or of a remnant constituent, and the LF mechanism of lowering to form fully interpretable phrases. What we are in need of is a theory that limits the search space of possible hypotheses, so that a child, when faced with “A/B *irrelevant stuff* B/A” where “AB” is interpreted as a constituent, can ultimately project the right grammar. The data are complex, different languages in all likelihood employ different mechanisms, and there is considerable disagreement among individual speakers. Colloquial Croatian, in particular, seems to allow much more word order latitude than has been previously recognized. Acknowledging this fact will, I hope, be the first step towards coming to grips with the problem.

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## **Russian Aspect as Bidirectional Optimization\***

Notions like markedness, competition, underspecification, context sensitivity and pragmatic implicatures play an important role in traditional Slavic aspectology. I propose in this paper to give these somewhat vague theoretical constructs a more explicit status within the framework of bidirectional optimality theory (BiOT), introduced in (Blutner 1998, 2000). Blutner's BiOT can merge these elements into a coherent theory of Russian aspect with strong predictions.

In section 1, I introduce Horn's division of pragmatic labor which corresponds to the phenomenon of partial blocking in BiOT (section 2). The bidirectional perspective is related to evolution, and I therefore start the discussion of the data with the emergence of the aspectual system (section 3).

In section 4, I show how the synchronic situation favors a polarization between complete event readings of the perfective and the progressive interpretation of the imperfective. Finally, in sections 5 and 6, I turn to the problematic complete event interpretations (the factual Ipf) of the imperfective. I argue that these cases of deblocking give rise to further polarization and pragmatic strengthening. In order to account for deblocking, a context-sensitive version of BiOT is called for, and the ranking of forms and meanings must be reconsidered.

### **1. The aspect game**

In Russian, for each telic VP in the lexicon the speaker is confronted with a choice between the imperfective (Ipf) and perfective (Pf) aspect. Consider for instance the aspectual competition in imperatives under negation:

- (1) *Ty, požalujsta, ne opazdyvaj.*  
 you please not become\_late<sub>IMP.IPF</sub>  
 "Please don't be late." (internet)

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\* I would like to thank Kjell Johan Sæbø for his always useful comments. I am also grateful to the organizers and reviewers of FDSL 6.5, as well as the audience of the workshop on Bidirectional Optimality Theory, organized by Anton Benz and Manfred Krifka in Berlin, May 2007.

- (2) [Čerez 10 minut budet uže pozdno.] *Smotri, ne opazdaj!*  
 look<sub>IMP.IPF</sub> not become\_late<sub>IMP.PF</sub>  
 “In 10 minutes it’ll already be too late. Be careful not to be late.”  
 (internet)

A negated imperative signals that the speaker wants the addressee not to perform an action *a*. Any text book of Russian grammar will inform the reader that Ipf is used in this environment – with one exception: Pf is preferred when the speaker issues a specific warning as in (2).

Ideally, one would like to account for aspectual competition in the compositional semantics. Ipf has the meaning [[m]], which produces the interpretation in [[(1)]] when combined with [[NEG]] and [[IMPERATIVE]]. Similarly, the meaning [[m’]] of Pf is responsible for the interpretation in [[(2)]]. However, it is not clear why the semantics of Pf should rule out the interpretation “S wants H not to perform *a*”, or, similarly, why Ipf is incompatible with the interpretation “S warns H against accidentally performing *a*”. Why, then, is the latter mainly associated with Pf?

In short, truth-conditional approaches fail in such cases because they don’t consider *alternative* forms which the speaker could have used. Without going into the details of negation and imperative mood, I propose that the form-meaning patterns in the examples above can be modeled as a *game*.<sup>1</sup> What is at stake for the two players S and H is the pairing of two forms – “NEG\_imperative\_Ipf” and “NEG\_imperative\_Pf” – with the two meanings “S wants H not to perform *a*” (m1) and “S warns H against accidentally performing *a*” (m2). I assume that the two forms are semantically underspecified and in principle compatible with both m1 and m2. Furthermore, I make the standard assumption that Ipf is the unmarked aspectual form in the grammar of Russian. Conceptually, the meaning m1 is less marked, more stereotypical than m2.

Economy is at the heart of rational communication. Accordingly, everything else being equal, the speaker prefers the less costly, most harmonic or most salient form, hence the ranking on forms is Ipf > Pf.<sup>2</sup> On the interpretation side, a more stereotypical situation is more economic (it minimizes the effort of the hearer) than the more unusual one, hence the ranking on meanings: m1 > m2. Given these two rankings, it is obvious that the optimal solution to our game is the pair <Ipf,m1>. However, as illustrated in the

1 Although there are certain similarities between game-theoretical approaches to language and bidirectional optimality theory, the analogy is here primarily intended at a pre-theoretical, metaphorical level.

2 ‘a > b’ should be read “a is better (more economic; more harmonic; more salient etc.) than b”. The ordering relation > will be constituted by two systems of ranked constraints: one for the speaker on forms and one for the hearer on meanings.

graphical representation below<sup>3</sup>, the tacit laws of rational communication can take us one step further:

	m1		m2
Ipf	•	←	∅
	↑		↑
Pf	∅	←	•

Figure 1: Division of pragmatic labor  
(aspect in imperatives under negation)

In figure 1, the speaker's preferences are represented by the vertical arrows. Irrespective of input meanings (columns) the speaker has a preference for Ipf. Similarly, the hearer's preferences correspond to the horizontal arrows. Regardless of whether H receives the input form Ipf or Pf (rows), H is drawn towards the interpretation m1. Given this scenario, it is arguably rational for language users to opt for the following division of pragmatic labor: the (un)marked form is paired – in conformity with iconicity – with the (un)marked interpretation; a polarization known as the Horn strategy in Neo-Gricean pragmatics. Hence, there are *two* winners in our little game – the form-meaning pairs <Ipf,m1> and <Pf,m2>, both marked with • in figure 1.

## 2. Partial blocking in bidirectional OT

In the Neo-Gricean paradigm, the traditional markedness theory of Slavic aspectology is finally provided with some predictive power through a reanalysis of Grice's maxim of quantity. At the same time, this kind of pragmatics makes crucial use of optimality scenarios and therefore invites a formal implementation in Optimality Theory (OT).

Recent implementations of Blutner's bidirectional OT, more precisely the so-called weak version of BiOT, account nicely for the Horn strategy without explicit reference to the somewhat confusing interaction of the Neo-Gricean I/R and Q-principles. As shown in Jäger (2002), BiOT provides an algorithm for calculating the (weakly) optimal pairs, thus capturing the phenomenon of *partial blocking*. Informally, the reasoning goes as follows:

We start the algorithm from the speaker's perspective. Given a situation corresponding to the meaning m1, the preferred form of S will be Ipf, hence the alternative <Pf,m1> is *blocked*. Then we turn to the hearer. Given the input form Ipf, H will choose the interpretation m1 due to her ranking on meanings, hence the alternative <Ipf,m2> is also blocked. Since H returns the same value as the

3 Similar representations were introduced in (Dekker & van Rooy 2000).

one  $S$  started out with, the pair  $\langle \text{Ipf}, m1 \rangle$  is considered optimal from both perspectives.

It is obviously rational for language users to “agree” on the form-meaning mapping  $\langle \text{Ipf}, m1 \rangle$  – the most frequent meaning is encoded by the shortest, most efficient or salient form. Importantly, however, in the process of finding the optimal pair, we were able to cross out two competing candidate pairs, marked as  $\emptyset$  in figure 1 above. Then, finally, the only remaining pair  $\langle \text{Pf}, m2 \rangle$ , itself not being blocked, is *weakly* optimal. In BiOT-terminology this polarization is known as partial blocking, cf. the BiOT-tableau below:

<i>Ranking:</i> Ipf > Pf; m1 > m2	m1	m2
Ipf	√ (optimal)	*(blocked)
Pf	*(blocked)	√ (weakly optimal)

*Table 1: Bidirectional optimization of aspect in imperatives under negation*

The corresponding formal definition is the following:

**Definition 1 (Bidirectional Optimality)**

A form-meaning pair  $\langle F, M \rangle$  is weakly optimal iff

1.  $\langle F, M \rangle$  is a member of GEN, i.e. generated by the grammar.
2. there is no pair  $\langle F', M \rangle$  in GEN such that  
(2.1)  $\langle F', M \rangle > \langle F, M \rangle$  and (2.2)  $\langle F', M \rangle$  is weakly optimal.
3. there is no pair  $\langle F, M' \rangle$  in GEN such that  
(3.1)  $\langle F, M' \rangle > \langle F, M \rangle$  and (3.2)  $\langle F, M' \rangle$  is weakly optimal.

Jäger (2002) has shown that bidirectional optimality is a well-defined notion despite its apparent circularity. The recursive weak BiOT adopted here differs crucially from strong BiOT, where any grammatical pair  $\langle F', M' \rangle$  (including pairs which are blocked themselves) can block the viability of other pairs. In strong BiOT only one pair (best form matched with best meaning) can survive in a 2x2 game such as the one described above, but our weak version is more interesting and allows for the coexistence of two (weakly) optimal solutions.

To what extent is there a bidirectionally optimal solution to aspectual competition in Russian? In order to answer this question, I propose to move from the periphery of the grammar (negated imperatives) to its center (indicative assertions). But first, the BiOT reasoning invites a diachronic excursus.

### 3. Bidirectional OT and the grammaticalization of aspect

Bidirectional OT has a strong diachronic dimension. Recall from the discussion in the previous sections that we started out at stage 1 with two semantically underspecified forms, which at a later stage 2 were to become associated with more specific interpretations. Thus, from a grammar generating both synonymy and ambiguity, BiOT predicts that the speaker with her ranking on the set of forms and the hearer with her ranking on the set of meanings will coordinate on form-meaning pairs which are most preferred from both perspectives.

As such, BiOT is a powerful explanatory principle in diachronic linguistics. Furthermore, pragmatic bidirectionality creates special interpretations which can become conventionalized. Many synchronic semantic and syntactic facts can therefore be analyzed from an evolutionary perspective as “frozen pragmatics”, cf. also the concept of “fossilization” in (Blutner 2006). OT thus aims at integrating the synchronic with the diachronic view of language, notably through the hypothesis that diachronic bidirectionality evolves into synchronic unidirectionality. In this paper, before moving to the synchronic data, I propose to have a look at the emergence of the aspectual system itself, i.e. the Pf:Ipf opposition which came to replace the old Indo-European aspectually loaded tenses Aorist:Imperfect.<sup>4</sup>

Russian aspect amounts to, *grosso modo*, a grammaticalization of prefixation, whereby prefixed verbs became perfective. A possible bidirectional scenario is depicted in tableau 2, where I assume the ranking on forms “(in)transitive simplex verbs > prefixed verbs” and the ranking on meanings “incomplete events > complete events”.

<i>Ranking:</i> f1 > f2; m1 > m2	incomplete events (m1)	complete events (m2)
simplex verb (f1)	√ (optimal)	*(blocked)
prefixed verb (f2)	*(blocked)	√ (weakly optimal)

Table 2: Partial blocking prior to grammaticalization of aspect

The form f1 subsumes both intransitive and transitive VPs. Used intransitively or with a non-quantized object, a simplex verb (*čitat'* – *read*) will always denote an activity, which here is considered a variant of m1. At stage 1 (Old Church Slavonic/Old Russian), in a situation where telicity/perfectivity is not grammaticalized, m1 is considered the most stereotypical meaning. At stage 2, by analogy with atelic VPs, transitive and quantized versions of f1 (e.g. *čitat' knigu*

4 See also (Grønn 2007) for an attempt to analyze the diachronic facts from the perspective of BiOT.

– *read the book*) are also associated with incomplete events (e.g. progressivity). Through *associative learning* (Benz 2006), the pair <f1,m1> gets strengthened at stage 3. The incomplete event interpretation becomes the *Hauptbedeutung* (central meaning) of simplex verbs. If the speaker then, at stage 4, wants to convey the complete event interpretation, he should choose the marked form f2. At stage 5, this invites a strengthening of the pair <f2,m2>: prefixation becomes equivalent with perfectivization, giving rise to a new aspectual system.

The evolution from stage 1 to stage 5 as described here constitutes a first round optimization of Russian aspect. As a result of this process, the status of *čitat' knigu* (f1) and the prefixed *pročitat' knigu* (f2) are clearly different: f1 is still semantically underspecified but receives a preferred interpretation m1, while f2 is no longer underspecified but conventionalized/grammaticalized with the meaning m2. In a second grammaticalization round (15<sup>th</sup>-16<sup>th</sup> centuries), numerous morphological gaps in the verbal paradigms are filled by the productive morphological device known as secondary imperfectivization. This produces aspectual pairs like *otkryt' \_Pf / otkryvat' \_Ipf* – *to open*, or even “aspectual triples”: *čitat' \_Ipf* (f1) > *pročitat' \_Pf* (f2) > *pročityvat' \_Ipf* (f3). Accordingly, morphological complexity cannot any longer be the crucial factor for ranking of forms since this would not produce a linearly ordered ranking of Pf and Ipf.

#### 4. Synchronic polarization

From the point of view of bidirectional optimization, how do we make sense of the synchronic situation, exemplified below with some closely related telic event predicates?

- (3) [*Dva drugikh učastnika etoj konferencii citirovali Dostoevskogo.*]  
*I tak slučilos', čto kogda menja priglasili učastvovat'*  
 and so happen<sub>PAST.PF</sub> that when me<sub>ACC</sub> invite<sub>PAST.PF</sub> participate<sub>IPF</sub>  
*v konferencii, ja kak raz čital "Prestuplenie i nakazanie".*  
 in conference I how just read<sub>PAST.IPF</sub> C&P.  
 “Two other participants at the conference cited Dostoevsky. And so it happened that when they invited me to participate at the conference, I was just reading “Crime and Punishment”.” (internet)
- (4) *Ja čital "Vojnu i Mir" v šestom klasse,*  
 I read<sub>PAST.IPF</sub> “War and Peace” in sixth grade  
*pročital polnost'ju za 6 dnej.*  
 read<sub>PAST.PF</sub> completely in 6 days  
 “I read “War and Peace” in 6<sup>th</sup> grade, read it through in 6 days.” (internet)

The challenge posed by these indicative past sentences becomes more transparent if we adopt a slightly more precise representation of the inventory of meanings. Aspect belongs to the temporal domain, and examples like (3) and (4) are therefore expected to receive a straightforward semantics, unlike the negated imperatives in (1)-(2), where the role of aspect was rather unclear.

I assume a standard compositional semantics, in which aspect is treated as a temporal relation between the event time and the Reichenbachian assertion time. The value of the latter is typically provided by tense and/or temporal adverbials, which take scope over aspect. In our discussion below, the interpretation of aspect will be reduced to two opposite temporal configurations: the inclusion relations  $e \subseteq t$  (the event  $e$  is temporally included in the assertion time  $t$ , i.e. a complete event interpretation) and  $t \subseteq e$  (an incomplete event interpretation). As a result of the diachronic process outlined in section 3, Pf grammatically encodes the complete event interpretation, while the meaning of Ipf remains underspecified and compatible with both these inclusion relations. For simplicity, we can think of the meaning of Ipf as the disjunction: “ $e \subseteq t$  or  $t \subseteq e$ ”.<sup>5</sup>

The speaker’s task – whether to choose Pf or Ipf – is trivial in case of a situation corresponding to  $t \subseteq e$ , as in (3), where the value of  $t$  is provided by the punctual *kogda/when* clause, but:

- (i) What is S’s best choice given the input meaning  $e \subseteq t$ ?

Similarly, the hearer’s task is trivial in case of the speaker’s preference for Pf. The more interesting issue is related to disambiguation:

- (ii) If S chooses Ipf, which interpretation should H adopt?

A standard BiOT approach to these questions starts by looking at possible rankings of the relevant forms and meanings. However, the synchronic situation is less transparent than the diachronic one (section 3) for various reasons: Pf is not underspecified synchronically, and Ipf is not necessarily a lighter expression than Pf (due to secondary imperfectivization). These facts make it non-trivial to decide on the rankings.<sup>6</sup> However, Blutner’s (1998) use of the function *conditional informativity* (“surprise value”) in his original version of BiOT suggests a way out.

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5 Alternatively, one could invoke some underspecified, general concept for the imperfective such as the relation of temporal overlap (Grønn 2004), which is entailed by – and thus compatible with – both disjuncts.

6 Another, more general, complicating factor is related to the status of synchronic explanations in BiOT.

Conditional informativity allows for a formally precise implementation of the Neo-Gricean idea that the speaker and hearer are cooperative agents, such that the best form-meaning pairs are the ones which minimize both the speaker's and hearer's effort. According to this function, the mapping  $\langle \text{Pf}, e \subseteq t \rangle$  is optimal inasmuch as the pair  $\langle \text{Pf}, t \subseteq e \rangle$  is not generated by the grammar of modern Russian and the probability of Pf denoting  $e \subseteq t$  is therefore maximal (i.e. 1). High probability in turn implies a low surprise value, which is good from the point of view of efficient communication. The probability of Ipf denoting  $e \subseteq t$  is arguably 0.5, hence the pair  $\langle \text{Ipf}, e \subseteq t \rangle$  has a higher surprise value and is therefore blocked by the rating of  $\langle \text{Pf}, e \subseteq t \rangle$ . Finally,  $\langle \text{Ipf}, t \subseteq e \rangle$  receives the same numbers as  $\langle \text{Ipf}, e \subseteq t \rangle$ , but the former survives as being bidirectionally (weakly) optimal, see (Grønn 2006) for details of this approach.

The results of applying conditional informativity comply with the intuition that Pf is in a sense logically stronger than Ipf, since the former realises its (only) meaning with higher probability than Ipf. However, this version of BiOT still predicts blocking of  $\langle \text{Ipf}, e \subseteq t \rangle$ , despite what the imperfective in example (4) tells us: “the event  $e$  of reading *War and Peace*”  $\subseteq$  “the interval  $t$  corresponding to 6<sup>th</sup> grade”.

The data in (3)-(4) resembles a 2x2 game with three solutions, preserving ambiguity<sup>7</sup> – a situation which cannot be modeled in terms of bidirectional optimization (two-solutions games). BiOT predicts that the self-organization in language, aiming at successful communication, provides for an optimal solution such as Horn's equilibrium. However, the notorious *obščefaktičeskoe značenie* (the factual Ipf – Grønn 2004) in example (4) obviously blurs this picture. Do we have to give up BiOT in the synchronic analysis of Russian aspect? Such a conclusion is premature. Even in its current version, BiOT nicely accounts for the *restrictions* on the complete event interpretation of Ipf. An example is provided by comparing (5) to (5’):

(5) *Kogda my poženilis’, on uže čital "Vojnu i Mir".*  
 when we marry<sub>PAST.PF</sub> he already read<sub>PAST.IPF</sub> “War and Peace”  
 “When we got married, he was already reading “War and Peace”.”

(5’) ... *on uže pročital "Vojnu i Mir".*  
 ... he already read<sub>PAST.PF</sub> “War and Peace”  
 “(when we got married), he had already read “War and Peace”.”

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7 BiOT treats synonymy and ambiguity as equivalent phenomena, the one being the mirror image of the other. However, ambiguity seems to be much more common in natural language than true synonymy.

In actual language use, we typically observe a polarization with two bidirectionally optimal winners for the past event of reading “War and Peace”:  $\langle \text{IpF}, \text{“the time of we’re getting married”} \subseteq e \rangle$  in (5) and  $\langle \text{Pf}, e \subseteq \text{“the whole past preceding the time of we’re getting married”} \rangle$  in (5’). In the first pair – the “progressive” interpretation – the reference time of the *kogda/when* clause serves directly as the assertion time  $t$  for the aspectual relation in the main clause. The second pair corresponds to a relative past interpretation, where past tense (the  $l$ -morpheme) is interpreted as a past relative not to the utterance time, but to the reference time provided by the *kogda/when* clause (see Grønn 2004 for details on the temporal calculation of such cases).

In principle, the underspecified semantics of IpF is compatible with both these temporal configurations<sup>8</sup>, so the question is why a relative past with a complete event interpretation of IpF is blocked in (5) according to native speakers:  $\ast \langle \text{IpF}, e \subseteq \text{“the whole past preceding the time of we’re getting married”} \rangle$ . In Grønn (2006), I modeled this blocking phenomenon using Blutner’s conditional informativity. This approach correctly predicts that the progressive should be considered the *Hauptbedeutung* of the imperfective. Furthermore, if the hearer’s *context* (common ground) is compatible with both a progressive/incomplete and complete event interpretation of IpF, the progressive reading is the winner, and the apparent ambiguity disappears.<sup>9</sup>

It turns out that once we take contexts into consideration, we can still analyze the aspectual system in terms of bidirectional optimization. Below, I will focus on contexts which license the complete event interpretation of IpF.

## 5. Context-sensitivity and deblocking: making sense of the factual IpF

A straightforward BiOT-approach is not able to explain the factual IpF in (4), which seems to imply a 2x2 game with genuine ambiguity. In the BiOT-literature on lexical pragmatics, such phenomena are referred to as *deblocking*.

Blutner (1998) discusses a classical example of conceptual grinding involving the standard form-meaning pairs  $\langle \text{‘cow’}, \text{countable animal} \rangle$  and  $\langle \text{‘beef’}, \text{non-countable cow-meat} \rangle$ . He notes that the pair  $\langle \text{‘cow’}, \text{non-countable cow-meat} \rangle$  appears under special conditions, cf. table 3.

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8 The factual IpF occurs in relative past configurations for instance when the verb is embedded under attitude predicates:

(i) *Ne bylo somnenij, čto ja prežde vstrečal ee*  
 not be<sub>PAST</sub> doubt, that I earlier meet<sub>PAST.IPF</sub> her  
 “There was no doubt that I had met her before.” (internet)

9 “A complete event interpretation  $e \subseteq t$  is not available for the IpF whenever a progressive/processual  $t \subseteq e$  interpretation is possible” (*Theorem 1* in Grønn 2006).

	countable animal (m1)	non-countable cow-meat (m2)
‘cow’ (f1)	√ (optimal)	*(deblocking in certain contexts: “Hindus are not allowed to eat cow.”)
‘beef’ (f2)	*(ungrammatical)	√ (weakly optimal)

Table 3: Conceptual grinding and deblocking

In a 2x2 game, where  $\langle f1, m1 \rangle$  is optimal and  $\langle f2, m2 \rangle$  is weakly optimal, deblocking of the pair  $\langle f1, m2 \rangle$  may occur in contexts where m2 does not retain its stereotypical interpretation (which is associated with f2). In the case of conceptual grinding above, the form ‘cow’ (f1) can only be mapped to the meaning ‘cow-meat’ (m2) if the latter is understood in some unusual sense.

What we want is a model which captures the fact that  $t \subseteq e$  is the *Hauptbedeutung*, while  $e \subseteq t$  is not excluded as the interpretation of IpF. The solution is to add a contextual parameter.<sup>10</sup> Following Benz (2001) and van Rooy (2004a,b), I will derive the ordering relation between form-meaning pairs from the more “traditional” OT constraints. Importantly, a separate set of ranked constraints is relevant for ordering forms (the speaker’s task) and for ordering meanings (the hearer’s task). Furthermore, we need to distinguish between contexts for S and H: “in switching from the speaker’s to the interpreter’s role we have to be cautious about the contexts and the information the hearer has about contexts. [...] we can assume that he has always less information than the speaker, hence, more  $\langle F, M \rangle$ -pairs to consider – all pairs which are grammatical in any of his epistemically possible contexts” (Benz 2001:3).

As noted by Benz (2001), in context-sensitive BiOT it may be that H prefers, for a given form, a meaning which is compatible with the common ground but still ungrammatical in the actual context of S. I therefore need to add a global principle according to which S must avoid forms leading into such “dead ends”.

### 5.1. Constraint for the hearer: Do not accommodate!

The ranking of meanings independent of forms (and vice versa: the ranking of forms independent of meanings) is not easy to motivate. Concerning the ranking of meanings, I propose a single, general constraint for H: “Do not accommo-

10 Benz (2001) gives a rigid definition of bidirectional optimality for dynamic contexts with updates on information states. I will make use of some of his ideas below, although with less emphasis on the mathematical properties of the framework.

date!”.<sup>11</sup> This simple economy principle is in line with Zeevat (2000), who argues that the original version of BiOT puts too much responsibility on H. H should merely be concerned with the task of understanding S’s utterance.

Now we can actually give an alternative or revised explanation for the blocking of \*<Ipf,e $\subseteq$  “the whole past *preceding* the time of we’re getting married”> in example (5/5’) above. Production precedes interpretation, so the algorithm starts with S’s choice of Ipf in a context for S where the complete reading event precedes the marriage. H doesn’t know the true state of affairs, and has to choose between the complete event interpretation and the progressive. Given the constraint “Do not accommodate!”, H prefers the progressive interpretation since a discourse referent *t* in the aspectual relation  $t \subseteq e$  is overtly provided by the *kogda/when* clause in S’s utterance. The alternative complete event interpretation, on the other hand, is more involved inasmuch as the value of *t* then has to be constructed in a non-standard way through partial accommodation. However, H’s preference for the progressive leads to a *dead end* – the configuration  $t \subseteq e$ , where *t* equals the time of the marriage, is not grammatical for S in a context where the reading event occurred prior to the marriage! Since S should not mislead H, she is not allowed to use Ipf with the rather complex relative past interpretation in (5’).

On this view, the blocking of the complete event interpretation of Ipf in (5’) is due to the fact that H, unlike S, is not in a position to exclude the progressive reading.

## 5.2. Constraint for the speaker: context-dependent salience?

Despite the phenomenon of secondary imperfectivization, is it still possible to consider Ipf as the unmarked form, given the role of Ipf as an aspectual default in statives, in present tense, under negation etc.? According to Blutner (p.c.), complexity of forms is not the only relevant parameter in ranking on forms. Some natural language phenomena seem to be derived from a ranking on forms related to salience and/or frequency. Let us try to model some standard cases of factual Ipf assuming the ranking Ipf > Pf:

- (6) A: *Krasivo ukrasili elku.* B: *Kto ukrašal?*  
 beautifully decorate<sub>PAST.PF.(PLUR)</sub> spruce who decorate<sub>PAST.IPF.</sub>  
 “A: They decorated the Christmas tree beautifully. B: Who decorated it?”

In Grønn (2004, 2006), I argued that the factual Ipf in speaker B’s utterance should be analyzed as anaphoric. Speaker A asserts the existence of a complete

<sup>11</sup> This constraint is also known as “\*new” or “avoid introduction of new discourse referents”.

event through a perfective verb, and speaker B refers anaphorically to this very same event by presupposing its existence and shifting focus to the agent.

Speaker B's preference for IpF is arguably "contextually optimal" given the rankings above. Let's check this again in a procedural way, by starting the sequential game with the best form for S in S's context. The ranking on forms gives preference to IpF. The common ground entails a complete event due to the previous utterance by A, hence H will return the pair  $\langle \text{IpF}, e \subseteq t \rangle$ , which does not require any accommodation. Since S and H agree on this pair, it is obviously contextually optimal.

Another prototypical example of the factual IpF is the following:

- (7) *Kto čital "Vojnu i Mir"?*  
 who read<sub>PAST.IPF.</sub> "War and Peace"  
 "Who has read "War and Peace"?"

Again I make the assumption (to be revised later) that S prefers IpF as an aspectual default in this non-progressive "out of the blue" context. H then has to choose between  $e \subseteq t$  and  $t \subseteq e$  with a preference for the meaning which involves the least violations of the constraint "Do not accommodate!". The central issue here is how H constructs a discourse referent  $t$  for the assertion time of the aspectual relation. The overt past tense morpheme in S's utterance provides a value for  $t$ , which can roughly be paraphrased as "the whole past preceding the utterance time". This interval is certainly too big for the configuration  $t \subseteq e$ , but just what is needed for the complete event interpretation  $e \subseteq t$ . On the other hand, the alternative progressive interpretation would violate the hearer's constraint, since it would require accommodation of a time  $t$  referring to "some point (when?) in the past". Hence, H prefers  $e \subseteq t$ , and the game ends with the optimal pair  $\langle \text{IpF}, e \subseteq t \rangle$ .

There are some problems with this line of reasoning. The BiOT perspective predicts that  $\langle \text{Pf}, e \subseteq t \rangle$  be blocked in (6) and (7). This prediction is clearly too strong; with a slight modification of the examples Pf is even the preferred:

- (6') ... *Kto tak velikolepno ukrasil?*  
 who so splendidly decorate<sub>PAST.PF.</sub>  
 "(They decorated the Christmas tree beautifully.) Who decorated it so splendidly?"

The same holds for (7). The use of Pf in (7') – a joke from a classroom situation – is not odd, it simply has a slightly different interpretation.

- (7') *–Kto pročital “Vojnu i Mir”?*  
 who read<sub>PAST.PF.</sub> “War and Peace”  
 [*–A čto, ee pročitat’ nado bylo? –Konečno. –Čert, a ja perepisal.*]  
 “–Who has read *War and Peace*? –What! Were we supposed to read it?  
 –Of course. –Oh shit, I rewrote it.” (internet)

In order to explain these prototypical cases of aspectual competition, I propose to take the contextual approach a step further. The idea is in a nutshell that deblocking leads to a second round of partial blocking. However, once we restrict our attention to contexts where the common ground and/or the constraint on accommodation exclude an incomplete event interpretation, Pf becomes the most salient, default aspectual choice.

## 6. From deblocking to partial blocking

The factual Ip<sub>f</sub> in (6) and (7) has one characteristic in common: The speaker’s focus is not on the temporal result state of the event. On the contrary, Pf is preferred whenever the context requires marking of the result.

The nature of aspectual competition seems to fit into Relevance theoretic reasoning: “Of two utterances that take the same amount of processing, it is the one with most contextual implications that will be the more relevant; and of two utterances which have the same number of contextual implications, it is the one which takes the least amount of processing that will be the more relevant” (Sperber and Wilson 1982, cited from van Rooy 2004a).

However, factual Ip<sub>f</sub> cannot be explained away as a default aspectual usage. This is particularly clear from a comparison of the aspectual choice in (8/8’), where Ip<sub>f</sub> gives rise to the rather peculiar “convention of annulled result” (*dvunapravlennoe značenie*):

- (8) *Kto otkryl okno?*  
 who open<sub>PAST.PF.</sub> window.  
 “Who has opened the window?” (*the window is currently open*)
- (8') *Kto otkryval okno?*  
 who open<sub>PAST.IPF.</sub> window.  
 “Who had the window open?” (*the window is currently closed*)

In contexts cancelling the blocking of the factual Ip<sub>f</sub>, i.e. in contexts where an incomplete event interpretation is ruled out *a priori*, Pf is clearly the most frequent and salient form. Accordingly, the speaker’s ranking on forms is Pf > Ip<sub>f</sub> in these deblocking contexts. Furthermore, from the Horn strategy with its

partial blocking we know that the most harmonic, salient form seeks a stereotypical interpretation. In the case of complete event interpretations, the result state following the event typically holds at the utterance time. For instance, when some agent has opened a window, we expect by default the window to be open. Hence, by associative learning (Benz 2006) it is expected that Pf acquires the implicature of *current relevance of the result state*. This explains why a resultative perfect in Germanic languages always corresponds to Pf in Russian, a language which does not have a morphologically overt perfect tense.

The following quote on blocking in BiOT captures what happens to the factual Ipf in (8') in light of the default Pf in (8): “The unemployed form may soon find a new job, generally expressing something closely related to but subtly different from the canonical interpretation that one might have expected” (Beaver & Lee, 2003: 140). The “convention of annulled result” in (8') is an illustration of such a non-canonical complete event interpretation. At the same time, this implicature is an epiphenomenon of the lexical properties of the VP “to open the window”, which contains an inherent *target state* (Grønn 2004). Thus, if the target state is cancelled or reversed, Ipf can still emerge as the winner.

The general picture, suggesting a uniform analysis of examples (6)-(8), is given in table 4. The specific polarization in (8/8') is represented in table 5.

<i>Ranking in contexts incompatible with incomplete events: Pf &gt; Ipf; m1 &gt; m2</i>	canonical $e \subseteq t$ (+RES): m1	non-canonical $e \subseteq t$ (RES is irrelevant): m2
Pf	√ (optimal)	*(blocked)
Ipf	*(blocked)	√ (weakly optimal)

Table 4: Deblocking and partial blocking in a second round context-sensitive optimization

<i>Ranking: Pf &gt; Ipf; m1 &gt; m2</i>	$e \subseteq t$ + target state validity: m1	$e \subseteq t$ + target state cancellation: m2
Pf	√ (optimal)	*(blocked)
Ipf	*(blocked)	√ (weakly optimal)

Table 5: Deblocking and partial blocking with target state predicates

What is the status of the annulled result interpretation in (8'), i.e. the pair <Ipf,m2> in table 5? If bidirectional optimization is primarily a diachronic process, one might expect that the meaning m2 of Ipf becomes conventionalized and thus part of the truth-conditional content. However, at least synchronically, m2 is merely an unstable pragmatic implicature which is easily cancelled:

- (9) *Eto ty otkryval dver' grjaznymi rukami?*  
 that you open<sub>PAST.IPF</sub> door dirty<sub>INSTR</sub> hands<sub>INSTR</sub>  
 "Was it you who opened the door with dirty hands?" (internet)

In this particular context, the common ground entails the existence of a previous event of opening the door. Hence, the motivation for S's choice of Ipf is similar to example (6) above, i.e. a case of event anaphora with focus on the agent. Although the predicate "to open the door" has an inherent target state, the issue of target state validity is irrelevant in (9), and the implicature m2 does not arise.

In fact, from the use of the special form Ipf in examples such as (8'), H can only conclude that something special is going on w.r.t. the event of opening the window. In most, but not all, contexts, the specific strengthening of this implicature amounts to cancellation of the target state.

## 7. Conclusion

Aspect is a linguistic phenomenon which traditionally has been analyzed within the semantic subsystem, but may, in some respects, find a better explanation in the pragmatic subsystem of BiOT. I have shown that if we adopt a *context-sensitive* version of Bidirectional OT, there is *one* solution (one equilibrium) to the aspect game, at least for the cases discussed here.

The original version of bidirectional OT was mainly concerned with lexical pragmatics ("kill" vs. "cause to die"). Blutner (1998:45f.) acknowledged the need for more realistic examples and more empirical evidence and studies. It seems to me that the study of the aspectual system in Slavic is an area where BiOT can be a valuable tool, although it is far from evident where exactly the compositional semantics ends and the bidirectional OT-pragmatics starts.

Time is ripe to mention a few more problematic points of the approach presented here. In BiOT, "alternatives must contrast in view of an element which is qualitatively similar in a relevant sense" (Blutner 1998:26). For this reason, I have restricted the analysis to complete vs. incomplete event interpretations, abstracting away from a whole range of other usages of the imperfective in Russian, e.g. the habitual-iterative readings. Hopefully, the general findings remain valid if one tries to incorporate the analysis into the larger picture.

What is particularly attractive about Russian aspect is the clear opposition between two forms, Pf:Ipf. However, even this aspect of the analysis is an idealisation. The data discussed here suggest that the set of forms may in fact be considerably extended, taking into account the combination of each of the two aspects with various temporal adverbials, tenses, information structure etc.

This being said, the BiOT-perspective is a nice way of factoring out the particular status of implicatures arising from competition between two members of a grammatical category. At every level of optimization, we get a polarization, a pragmatic strengthening, of the interpretations accorded to the two aspectual competitors. The Horn strategy implemented in BiOT captures a pragmatic iconicity principle which allows S and H to use language efficiently: (un)marked forms are paired with (un)marked meanings. However, BiOT must be applied with caution in view of such phenomena as deblocking which may completely reverse the ranking of forms.

The role of the Horn strategy (partial blocking) in Russian aspect raises the question of diachronic vs. synchronic explanations. The two approaches may coexist in BiOT, as argued recently by Blutner (2006). A difference is worth pointing out, though: when partial blocking occurs in cases of deblocking (e.g. the annulled result reading of Ipf), the coordination game between S and H does not seem to be fully conventionalized. This is not surprising since the context sensitivity of this phenomenon suggests that the implicatures involved are part of on-line, local reasoning. On the contrary, in the diachronic case, the division of pragmatic labor ended up being partly conventionalized/grammaticalized (Ipf remains underspecified).

Finally, I would like to emphasize one consequence of the BiOT-perspective on the imperfective in Russian. A sentence is truly ambiguous only if there are at least two interpretations of it that are optimally relevant (van Rooy 2004a). The analysis presented here shows that the alleged ambiguity of Ipf is not so frequent after all. By enriching the standard BiOT-models with contexts, it can be demonstrated that games containing the underspecified Ipf typically give rise to an equilibrium: one separating Horn strategy for each context.

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## **Bound to be bound (on certain similarities between pronominal and anaphor binding)\***

This paper deals with one important property of bound anaphora. Roughly speaking, it states that variables may be bound at different stages of the derivation. This generalization is mainly based on Russian data, though sometimes we refer to the evidence from other languages as well.

The paper is organized as follows. In Section 1, we investigate constraints on binding of pronominals by quantificational NPs (QNP) in Russian. Section 2 provides some cross linguistic parallels. In Section 3, properties of pronominal and anaphor binding are compared. It is shown that being cases of bound anaphora pronominal and anaphor binding behave very similarly with respect to such syntactic operations as movement and reconstruction. Section 4 provides an analysis of common properties of bound anaphora. Section 5 is a short conclusion.

### **1. Constraints on QNP-pronominal binding in Russian**

#### **1.1. Linear Precedence Requirement**

In Padučeva (1985), it is argued that QNPs in Russian must precede pronominals in order to bind them. At first glance, the linear precedence requirement really seems to be crucial for binding to be possible. Consider sentences in (1). In (1a), the main clause containing the QNP *každyj student* precedes the adjunct clause containing the pronominal *emu* and binding is possible. On the contrary, binding is impossible in (1b), in which the linear order of the clauses, and hence, of the QNP and the pronominal, is inverse. (1c) shows that the constraint that rules out (1b) is specific for QNP-pronominal binding: non-quantificational NPs, as in (1c), can be preceded by coreferent pronouns.

- (1) a. [*každyj student*]<sub>i</sub> *obradovalsja,*  
           every<sub>NOM</sub> student<sub>NOM</sub> was.pleased  
           *kogda pro emu<sub>i</sub> podarili podarok.*  
           when they him presented present<sub>ACC</sub>  
           “Every student<sub>i</sub> was pleased when he<sub>i</sub> was given a present.”

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\* We would like to thank the audience at FDSL 6.5 as well as the anonymous reviewers for numerous useful comments and suggestions. All faults and misunderstandings are ours.

- b. \**kogda* pro *emu<sub>i</sub>* *podarili* *podarok*,  
 when they him presented present<sub>ACC</sub>  
*[každyj student]<sub>i</sub>* *obradovalsja*.  
 every<sub>NOM</sub> student<sub>NOM</sub> was.pleased
- c. <sup>OK</sup>*kogda* pro *emu<sub>i</sub>* *podarili* *podarok*, *Petr<sub>i</sub>* *obradovalsja*.  
 when they him presented present<sub>ACC</sub> Peter<sub>NOM</sub> was.pleased  
 “Peter<sub>i</sub> was pleased when he<sub>i</sub> was given a present.”

However, the following novel data suggests that linear precedence in the overt form is not necessary for QNP-pronominal binding. Consider sentences in (2-3):

- (2) [*ženščinu*, [*kotoraja* *rodit* *jemu<sub>i</sub>* *syna*,]]  
 woman<sub>ACC</sub> which<sub>NOM</sub> bear him son<sub>ACC</sub>  
*iščet* [*každyj* *mužčina*]<sub>i</sub>.  
 searches every<sub>NOM</sub> man<sub>NOM</sub>  
 “Every man<sub>i</sub> looks for a woman that will give birth to his<sub>i</sub> son.”
- (3) [*o* *ljubvi*, [*kotoraja* *perevernet* *vsju* *ee<sub>i</sub>* *žizn'*,]]  
 about love<sub>PREP</sub> which<sub>NOM</sub> turns.over all<sub>ACC</sub> her life<sub>ACC</sub>  
*mečtaet* [*každaja* *ženščina*]<sub>i</sub>.  
 dreams every<sub>NOM</sub> woman<sub>NOM</sub>  
 “Every woman<sub>i</sub> dreams of love that will turn over her<sub>i</sub> whole life.”

In (2–3), the linear precedence requirement is not fulfilled, but binding is still possible. In the next paragraph we turn to some other possible constraints on pronominal binding in Russian.

## 1.2. C-command Requirement

In Reinhart (1983a,b), Tanya Reinhart proposed a condition on QNP-pronominal binding different from linear precedence – the c-command requirement. She argued that QNPs must c-command bound pronominals at S-structure. Indeed, it seems true for Russian that if a QNP c-commands a pronominal, binding is possible. Consider sentences in (4-5):

- (4) *Každyj<sub>i</sub>* *xočet*, *čtoby* pro *ego<sub>i</sub>* *ljubili*.  
 every<sub>NOM</sub> wants COMP they him love  
 “Everybody wants to be loved.”

- (5) *Petr vernul každy<sub>i</sub> to, čto on<sub>i</sub> napisal.*  
 Peter<sub>NOM</sub> returned every<sub>DAT</sub> that<sub>ACC</sub> what<sub>ACC</sub> he wrote  
 “Peter returned everybody<sub>i</sub> what he<sub>i</sub> had written.”

However, c-command is not a necessary condition for the possibility of binding in Russian<sup>1</sup>. Consider examples (6-8) which are grammatical though in each of them a QNP does not c-command a bound pronominal:

- (6) *on prikrepil [k [každy<sub>i</sub> kaktusu]<sub>i</sub>]  
 he attached to every<sub>DAT</sub> cactus<sub>DAT</sub>  
 tablčku s ego<sub>i</sub> latinskim nazvanijem.  
 tablet<sub>ACC</sub> with its Latin<sub>INST</sub> name<sub>INST</sub>  
 Lit.: “He attached to each cactus<sub>i</sub> a tablet bearing its<sub>i</sub> Latin name.”*

- (7) *na večere [roditeli [každygo škol'nika]<sub>i</sub>]  
 on evening<sub>PREP</sub> parents<sub>NOM</sub> every<sub>GEN</sub> schoolboy<sub>GEN</sub>  
 poznakomilis' s ego<sub>i</sub> odnoklassnikami.  
 got.acquainted with his classmates<sub>INST</sub>  
 Lit.: “On the evening party each schoolboy's<sub>i</sub> parents got acquainted with his<sub>i</sub> classmates.”*

- (8) *[posle [okončanja [každygo seminara]<sub>i</sub>]  
 after end<sub>GEN</sub> every<sub>GEN</sub> seminar<sub>GEN</sub>  
 analizirujutsja ego<sub>i</sub> itogi.  
 are.analyzed its results<sub>NOM</sub>  
 Lit.: After each seminar's<sub>i</sub> end its<sub>i</sub> results are analyzed.*

Consequently, we can conclude that the c-command requirement is not crucial for binding in Russian as well.

### 1.3. Constraints on QR

The discussion in two previous paragraphs leads us to the conclusion that constraints on QNP-pronominal binding in Russian cannot be trivially described in terms of linear precedence or c-command in the overt form (final stage of the derivation, mapped to PF). In fact, QNP-pronominal dependencies can be better described and explained in terms of c-command, yielded by Quantifier raising (QR), at LF. The evidence for this comes from the fact that QNP-pronominal

1 It seems that in English c-command in the overt form is also not always necessary. Cf. examples (16–17) from Sportiche (2006) below.

binding obeys certain constraints on movement. These include most island constraints/CED and Weak crossover (WCO).

### 1.3.1. Sensitivity to Islands/CED

It is impossible for a QNP inside an island to bind a pronominal outside it. Consider sentences in (9-11). In (9), a quantifier is situated inside a relative clause, in (10), it is inside an adjunct clause, and in (11), inside a sentential subject.

- (9) \**ljubov'*, [*o katoroj mečtala [každaja iz nix]<sub>i</sub>*],  
 love<sub>NOM</sub> about which<sub>PREP</sub> dreamt every<sub>NOM</sub> of them  
*prošla mimo nee<sub>i</sub>*.  
 passed past her  
 Lit.: “Love, which [each of them]<sub>i</sub> had been dreaming about, passed her<sub>i</sub> by”

- (10) \**[kogda [každyj student]<sub>i</sub> sdal ekzamen]*, *on<sub>i</sub> vypil piva*.  
 when every<sub>NOM</sub> student<sub>NOM</sub> passed exam<sub>ACC</sub> he drank beer<sub>GEN</sub>  
 Lit.: “When every student<sub>i</sub> had passed the exam, he<sub>i</sub> drank some beer.”

- (11) \**[čto Maša b'jet [každogo novička]<sub>i</sub> v klasse]*,  
 COMP Mary<sub>NOM</sub> beats every<sub>ACC</sub> newcomer<sub>ACC</sub> in class<sub>PREP</sub>  
*pugaet ego<sub>i</sub>*.  
 frightens him  
 Lit.: “That Mary beats every newcomer<sub>i</sub> in the class, frightens him<sub>i</sub>.”

### 1.3.2. Weak Crossover Effect

If we assume that there is covert QR in Russian, then it is easy to explain the ungrammaticality of examples like (1b) in which a quantifier does not precede a pronominal. They are just ruled out by whatever rules out classic examples of WCO.

But then two types of cases should be considered which seem to be problematic for our analysis:

- 1) In examples like (12a) a QNP moved from its initial position past a pronominal to the left periphery of a sentence. The question arises why it is not subject to WCO?

- (12) a. *[každyju devočku]<sub>i</sub> ljubit ee<sub>i</sub> sobaka t<sub>i</sub>.*  
 every<sub>ACC</sub> girl<sub>ACC</sub> loves her dog<sub>NOM</sub>  
 “Every girl<sub>i</sub> is loved by her<sub>i</sub> dog.” (example taken from Bailyn 2004)
- b. *\*ee<sub>i</sub> sobaka ljubit [každyju devočku]<sub>i</sub>.*  
 her dog<sub>NOM</sub> loves every<sub>ACC</sub> girl<sub>ACC</sub>

- 2) In examples like (2-3) pronominals precede QNPs in the overt form. If we assume QR at LF and WCO effect, that it may yield, why binding is still possible in these sentences?

Let us consider the first case. Recent investigations in Russian “free word order” showed that OVS-constructions like (12a) seem to be result of A-movement, which does not create a WCO configuration. For example, in Bailyn (2004), it is assumed that in these constructions direct object moves to Spec,TP, while the subject stays in Spec,vP (this is the so-called “generalized inversion”). In Williams (2006), it is convincingly shown that OVS word order in Russian is the result of movement of a direct object to a specifier of a phrase that is higher than TP and lower than CP (Williams calls it LP). However, as Williams claims, this position shares some properties of A-positions, for example, movement into it does not yield WCO effect.

Cf. the following example with OSV word order, which involves topicalization, an instance of A'-movement:

- (13) *\*[každyju devočku]<sub>i</sub> ee<sub>i</sub> sobaka ljubit t<sub>i</sub>.*  
 every<sub>ACC</sub> girl<sub>ACC</sub> her dog<sub>NOM</sub> loves  
 “Every girl<sub>i</sub> is loved by her<sub>i</sub> dog.”

In (13), A'-movement creates WCO configuration, thus, binding is impossible.

Let us now turn to the second case (sentences like (2-3) where pronominals precede QNPs). There are at least three possible analyses. We will examine each of them and show their virtues and vices:

- 1) We could assume that relative clauses in (2-3) are merged in the structure after QR (cf. Fox and Nissenbaum 1999 on possibility of insertion of adjuncts after QR in English). This analysis can perfectly explain possibility of binding in (2-3), but it fails in (14), where a pronominal is contained inside an argument, not an adjunct:

- (14) [*dokazat', čto pro ego<sub>i</sub> obvinili nespravedlivo,*]<sub>*j*</sub>  
 prove COMP they him accused wrongly  
*smog [každyj podsudimyj]<sub>i</sub> t<sub>j</sub>.*  
 managed every<sub>NOM</sub> defendant<sub>NOM</sub>  
 “Every defendant<sub>*i*</sub> managed to prove that he<sub>*i*</sub> was wrongly accused.”

- 2) The second analysis assumes that these examples involve LF reconstruction of the object into its initial position (then QNPs would precede pronominals they bind) followed by QR—then there would be no WCO violation. Cf. example (1b) in which the pronominal *emu* (him) is inside an adjunct, hence no reconstruction and no possibility of backward binding. Reconstruction of this type is done only because there is need to interpret a pronoun as a bound variable. Examples like (12) show that generally reconstruction in inversion constructions is not obligatory.
- 3) In (2-3) overt inversion (resulting in OVS word order) follows QR—then there would be no WCO violation. This may be evidence in favor of the claim that covert and overt movements can come in mixed order (cf. Bobaljik 2002, Pesetsky 2000, and others).

Having shown that the first (late adjunction) analysis seems to be not quite right, for the purposes of this paper we assume the second (reconstruction) analysis to be right. What is important is that

- (15) The interpretation of a pronominal as a bound variable is possible if there exists at least one stage of the derivation where a QNP could have the pronoun in its scope.  
 (Cf. similar ideas in Sportiche 2006)

(The possibility for a QNP to have a pronoun in its scope is the possibility to do QR not violating relevant constraints on movement.)

Different stages of derivation mentioned in (15) are achieved by reconstruction at LF. A QNP can bind a pronominal at the stage of derivation represented in the overt form, by direct mapping to LF and subsequent QR. This is the case with examples like (12a). But binding may happen at some previous (reconstructed) stage as well (as in (2-3)).<sup>2</sup>

<sup>2</sup> The possibility of reconstruction into intermediate positions for the purposes of QNP-pronominal binding still needs to be justified.

## 2. Pronominal binding at any stage of derivation: non-Slavic parallels

The generalization in (15) is very stable typologically.

In English, there are cases when pronominal binding seemingly involves reconstruction:

(16) *[Which of his<sub>i</sub> collaborators]<sub>j</sub> does [no politician]<sub>i</sub> ignore t<sub>j</sub>?*

(17) *Pictures of his<sub>i</sub> child seemed to everyone<sub>i</sub> [t<sub>i</sub> to be good]*  
 ((16) & (17) from Sportiche 2006)

There also exist cases when pronominal binding is impossible at an earlier stage of derivation but possible at a later stage:

(18) *[Every participant]<sub>i</sub> didn't seem to his<sub>i</sub> coach [t<sub>i</sub> to be in bad shape].*  
 (example from Sauerland 2003)

Similar picture of QNP-variable binding is found in Kabardian (North-West Caucasian language family). Kabardian is a “free word order” (basic SOV) language with very rich agreement morphology. However, it does not have all properties of a polysynthetic language in terms of (Baker 1996). For example, it does have true quantifiers like English *every* or Russian *každyj*. In Kabardian, a possessive pronoun *jə* can be bound by a QNP if this QNP precedes it in basic (SOV) or inversed (OSV) word order. Just as in the case of Russian, binding is possible both when QNP precedes a pronoun at an earlier stage of the derivation (19b) and when QNP precedes a pronoun only at a later stage (20b):

(19) a. *šxaž<sub>i</sub> jə<sub>i</sub> aner fowe jəlaB<sub>w</sub>.*  
 everyone his/her mother<sub>ABS</sub> well sees  
 “Everyone<sub>i</sub> loves his<sub>i</sub> mother.”

b. *jə<sub>i</sub> aner šxaž<sub>i</sub> fowe jəlaB<sub>w</sub>.*  
 his/her mother<sub>ABS</sub> everyone well sees  
 “Everyone<sub>i</sub> loves his<sub>i</sub> mother.”

(20) a. *\*jə<sub>i</sub> anem šxaž<sub>i</sub> fowe jəlaB<sub>w</sub>.* (WCO)  
 his/her mother<sub>ERG</sub> everyone well sees

b. *šxaž<sub>i</sub> jə<sub>i</sub> anem fowe jəlaB<sub>w</sub>.*  
 everyone his/her mother<sub>ERG</sub> well sees  
 “Everyone<sub>i</sub> is loved by his<sub>i</sub> mother.”

What this shows is that the cross-linguistic stability of mechanisms of QNP-pronominal binding is not a coincidence. In the next section, we will discuss the relevant phenomena in a broader context of bound anaphora.

### 3. Comparing pronominal and anaphor binding

The idea that some principles of grammar can apply at any stage of the derivation is not new. Perhaps the best known example of such a principle is the Condition A of Binding theory, as analyzed by Rizzi & Beletti (1988): “It suffices for principle A to be met somewhere, either at D-structure or S-structure or, perhaps, LF. Our claim then is that principle A is a kind of ‘anywhere’ principle—an assumption which does not seem conceptually less desirable than the standard assumption that it applies at some arbitrarily chosen level.” Later this point of view was supported in Epstein et al. (1998), Grewendorf and Sabel (1999), etc. Otherwise stated in Sportiche (2006), reconstruction for Condition A is optional. Cf. English examples in (21–22):

(21) *[Which of each other's<sub>i</sub> friends]<sub>j</sub> did they<sub>i</sub> remind t<sub>j</sub> that she saw Bill?*

(22) *They wonder [which pictures of each other<sub>i</sub>]<sub>j</sub> I preferred t<sub>j</sub>.*  
 ((21) & (22) from Sportiche 2006)

(23) *John<sub>i</sub> seems to himself<sub>i</sub> [t<sub>i</sub> to be a nice guy]*  
 (example from Lebeaux 1991)

In (21) the configuration in which the antecedent c-commands the anaphor is obtained via reconstruction of the moved NP to its initial position, while in (22) and (23) reconstruction will lead to the configuration in which the antecedent cannot bind the anaphor.

In Baltin (2003), it was shown that Condition A is not really an “anywhere” principle and that it can apply only at completion of a phase. The “anywhereness” of Condition A is even more doubtful since anaphors cross-linguistically impose very specific constraints on the nature of their antecedents. For example, in Russian reflexives can be generally bound only by subjects (subject being understood as the NP in Spec,vP, cf. Rappaport 1986, Williams 2006):

- (24) [*o svoem<sub>i</sub> dolgom puti k religii*]<sub>j</sub> nam  
 about REFL.POSS<sub>PREP</sub> long<sub>PREP</sub> way<sub>PREP</sub> to religion<sub>DAT</sub> us  
*rasskazal [deputat Petr Petrov]*<sub>i</sub> t<sub>j</sub>.  
 told deputy<sub>NOM</sub> Peter<sub>NOM</sub> Petrov<sub>NOM</sub>  
 “Deputy Peter Petrov told us about his long way to religion.”
- (25) [*svoego čekistskogo prošlogo*]<sub>j</sub> Putin<sub>i</sub> ne skryvaet t<sub>j</sub>.  
 REFL.POSS<sub>GEN</sub> KGB<sub>GEN</sub> past<sub>GEN</sub> Putin<sub>NOM</sub> not conceals  
 “Putin does not conceal his KGB past.”

However, (26) is ungrammatical, though the c-command requirement is fulfilled:

- (26) \**[každuju devočku]*<sub>i</sub> / *Mašu*<sub>i</sub> ljubit svoja<sub>i</sub> sobaka t<sub>i</sub>.  
 every<sub>ACC</sub> girl<sub>ACC</sub> Mary<sub>ACC</sub> loves REFL.POSS<sub>NOM</sub> dog<sub>NOM</sub>  
 “Every girl<sub>i</sub> / Mary<sub>i</sub> is loved by her<sub>i</sub> dog.” (cf. 12a)

Moreover, unlike English (22), in Russian anaphors cannot be bound across finite clause border:

- (27) \**Oni*<sub>i</sub> sprosili, kakie fotografii [drug druga]<sub>i</sub>  
 they<sub>ACC</sub> asked which<sub>ACC</sub> pictures<sub>ACC</sub> each others’s  
*ja uže videl?*  
 I already saw  
 “They asked, which pictures of each other I had already seen.”

Assuming that anaphors are typically interpreted as bound variables, it seems plausible to hypothesize that whenever Condition A appears to be some kind of anywhere principle (with all the reservations discussed above), it is just the effect of the general mechanisms of bound anaphora. The generalization in (15), thus, can be reformulated in (28)

- (28) The interpretation of a pronominal/anaphor as a bound variable may be possible at different stages of the derivation: the overt form or some reconstructed stage (binding is further constrained with respect to the position of the antecedent).

In this respect constraints on bound anaphora crucially differ from constraints on covaluation in terms of Reinhart (2000, 2006). In the next section, we will try to explain why it is so.

#### 4. What is special about bound anaphora?

It is well known that binding may not be possible in a given sentence even if pronominals, anaphors and R-expressions are in a configuration that is not prohibited by binding principles. Consider Condition C example from Sportiche (2006):

(29) *\*[Whose examination of John]<sub>i</sub> did he<sub>i</sub> fear t<sub>j</sub>?*

The R-expression (*John*) is not bound by the pronominal, and the pronominal (*he*) is not locally bound. Yet coreferring interpretation in (29) is impossible. Usually, it is explained by the fact that wh-phrase reconstructs at LF to its initial position. That leads to the violation of Condition C. The same analysis applies to classic Strong crossover cases (*\*Who<sub>i</sub> did he<sub>i</sub> see t<sub>j</sub>*) and to Russian examples of type (30):

- (30) a. *\*[každuju devočku]<sub>i</sub> ljubit ona<sub>i</sub> t<sub>i</sub>.*  
           every<sub>ACC</sub> girl<sub>ACC</sub> loves she  
           “Every girl<sub>i</sub> loves herself<sub>i</sub>.”
- b. *\*Mašu<sub>i</sub> ljubit ona<sub>i</sub> t<sub>i</sub>.*  
           Mary<sub>ACC</sub> loves she  
           “Mary<sub>i</sub> loves herself<sub>i</sub>.”

As stated in Sportiche (2006), reconstruction (of arguments) for Condition C is obligatory. In this respect Condition C is different from bound anaphora principles.

It turns out that sometimes a pronominal/reflexive can be interpreted as coindexed with its antecedent in post-movement structure in case of bound anaphora (as in (12a), (18), (20b), (21-23)) but never in case of Condition C (as in (29-30)). Why is it so?

The answer to this question largely depends on the theory of reconstruction. Here we adopt the copy theory of movement of Chomsky (1995) and the theory of reconstruction developed in Fox (2002, 2003).

We assume that movement of a given constituent (both in narrow syntax and at LF) creates its higher copy. To interpret the structure created by syntactic movement, a higher copy of a displaced constituent may be deleted at LF. Another option (the only available for LF-movement) is the interpretation of the lower copy either as a variable bound by the displaced constituent (we will call it Replacement with a variable) or as a structure containing a variable (it is created via Trace conversion, as proposed in Fox (2002, 2003). Trace conver-

sion is the combination of two rules that convert the lower copy of the displaced phrase to an interpretable object:

- (31) Trace Conversion (Fox 2002, 2003)<sup>3</sup>  
 Variable Insertion: (Det) Pred  $\rightarrow$  (Det) [Pred  $\lambda y(y=him_n)$ ]<sup>4</sup>  
 Determiner Replacement:  
 (Det) [Pred  $\lambda y(y=him_n)$ ]  $\rightarrow$  the [Pred  $\lambda y(y=him_n)$ ]

The output of Trace Conversion is interpreted by semantic rule in (32):

- (32) In a structure formed by DP movement,  $DP_n$  [ $\varphi \dots DP_n \dots$ ], the derived sister of DP,  $\varphi$ , is interpreted as a function that maps an individual,  $x$ , to the meaning of  $\varphi$  [ $x/n$ ].  $\varphi$  [ $x/n$ ] is the result of substituting every constituent with the index  $n$  in  $\varphi$  with  $him_x$ , a pronoun that denotes the individual  $x$ .

We assume that Higher copy deletion applies only when there is need to interpret a pronominal/reflexive inside a displaced constituent as bound by an antecedent which does not c-command it in S-structure. So, this is the case in (2–3, 14, 16–17, 19b, 21, 24–25) (seemingly, scope reconstruction happens in much the same way, but it is beyond the scope of our paper).

Consider, for example, LF-derivation of (14), repeated below as (33):

- (33) [*dokazat', čto pro ego<sub>i</sub> obvinili nespravedlivo,*]<sub>*j*</sub>  
 prove COMP they him accused wrongly  
*smog [každyj podsudimyj]<sub>i</sub> t<sub>j</sub>.* (*t* for the whole copy)  
 managed every<sub>NOM</sub> defendant<sub>NOM</sub>  
 “Every defendant<sub>*i*</sub> managed to prove that he<sub>*i*</sub> was wrongly accused.”

Higher copy deletion:

*[to prove that they accused him wrongly]*  
*managed every defendant [to prove that they accused him wrongly]  $\rightarrow$*   
*managed every defendant [to prove that they accused him wrongly]*

3 Similar ideas may be found in Sauerland (2000, 2001) where movement of a QNP *every boy* creates a configuration [*every boy*]<sub>*x*</sub> ... *the<sub>x</sub> boy* at LF.

4 Where  $n$  is the index of the moved QNP.

QR:

→ *[every defendant] managed [every defendant] to prove that they accused him wrongly*

Replacement with a variable:

*[every defendant] managed [every defendant] to prove that they accused him wrongly*

→ *every defendant ( $\lambda x$  ( $x$  managed to prove that they accused him wrongly))*

Trace conversion (semantically interpreted):

*[every defendant] managed [every defendant] to prove that they accused him wrongly*

→ *every defendant ( $\lambda x$  ( $the\ defendant\ x\ managed\ to\ prove\ that\ they\ accused\ him\ wrongly$ ))*

(Paraphrase: For every defendant,  $x$ , the defendant  $x$  managed to prove that they accused him wrongly.)

As shown, in the case in question both possible interpretations of the lower copy of the QNP (Replacement with a variable and Trace conversion) yield correct interpretation of the sentence, where the pronominal is bound by the QNP.

However, there are cases when the choice of lower copy interpretation is crucial. For example, coreferent interpretation in sentences like (29), repeated below as (34), can be ruled out only via Trace conversion, as shown in Fox (2002, 2003).

(34) \**[Whose examination of John]<sub>i</sub>] did he<sub>i</sub> fear t<sub>j</sub>?*

Trace conversion (semantically interpreted):

*[whose examination of John] did he fear [whose examination of John]*

→ *whose examination of John ( $\lambda x$  ( $he_i\ feared\ the\ examination\ of\ John_i\ x$ )).*

(Condition C violation, hence, coreference is prohibited)

Replacement with a variable:

*[whose examination of John] did he fear [whose examination of John]*

→ *whose examination of John ( $\lambda x$  ( $he\ feared\ x$ )).*

(No Condition C violation, hence, coreferent interpretation should be possible)

On the other hand, in sentences like (22), repeated as (35), Trace conversion will lead to an uninterpretable structure, and the only possibility is Replacement with a variable:

(35) *They wonder [which pictures of each other]<sub>i</sub> I preferred t<sub>j</sub>.*

Trace conversion (semantically interpreted):

*They wonder [which pictures of each other] I preferred [which pictures of each other]*

→ #*They wonder (which pictures of each other ( $\lambda x$  (I preferred the pictures of each other  $x$ )))*

(This structure cannot be interpreted, as there is no proper antecedent for the second occurrence of the anaphor)

Replacement with a variable:

*They wonder [which pictures of each other] I preferred [which pictures of each other]*

→ *They wonder (which pictures of each other ( $\lambda x$  (I preferred  $x$ )))*

We hypothesize that there is a complementary distribution between Trace Conversion and Replacement with a variable. Namely, Replacement with a variable applies if and only if displaced constituent contains an anaphor (to escape the possibility for that anaphor to be bound in several positions) or if it is a non-quantificational expression. In all other cases, Trace Conversion applies.

For example, Russian (12a), repeated below as (36), gets correct interpretation via Trace Conversion:

(36) *[každuju devočku]<sub>i</sub> ljubit ee<sub>i</sub> sobaka t<sub>i</sub>.*  
 every<sub>ACC</sub> girl<sub>ACC</sub> loves her dog<sub>NOM</sub>  
 “Every girl<sub>i</sub> is loved by her<sub>i</sub> dog.”

Trace conversion (semantically interpreted):

*[every girl] loves her dog [every girl]*

→ *every girl ( $\lambda x$  (her dog loves the girl  $x$ ))*

Trace conversion rules out the bound anaphora interpretation in sentences like (30a), repeated as (37):

(37) *\*[každuju devočku]<sub>i</sub> ljubit ona<sub>i</sub> t<sub>i</sub>.*  
 every<sub>ACC</sub> girl<sub>ACC</sub> loves she  
 “Every girl<sub>i</sub> loves herself<sub>i</sub>.”

Trace conversion (semantically interpreted):

*[every girl] loves she [every girl]*  
 $\rightarrow$  *every girl* ( $\lambda x$  (*she loves the girl x*))

After trace conversion, QNP *every girl* binds two variables, and *she* appears to be coreferent with *the girl x*, which violates Condition C. That is why binding interpretation is unavailable.

In a similar sentence with non-quantified NP, (30b), repeated as (38), Replacement with a variable applies:

- (38) \**Mašu<sub>i</sub> ljubit ona<sub>i</sub> t<sub>i</sub>.*  
 Mary<sub>ACC</sub> loves she  
 “Mary<sub>i</sub> loves herself<sub>i</sub>.”

Replacement with a variable:

*[Mary] loves she [Mary]*  
 $\rightarrow$  *Mary* ( $\lambda x$  (*she loves x*))

more precisely:

*Mary* ( $\lambda x$  (*she* ( $\lambda y$  (*y loves x*))))

After Replacement with a variable applies, the pronoun cannot bind the variable  $x$ , standing for the lower copy, since  $x$  is already bound (cf. similar argumentation in Reinhart 2000, 2006). However, they can appear to be bound by the same antecedent and hence covalued:

- (39) *Mary* ( $\lambda x$  ( $x$  ( $\lambda y$  (*y loves x*))))

This interpretation is ruled out by Reinhart’s (2000, 2006) Rule I:

- (40) Rule I:  
 $\alpha$  and  $\beta$  cannot be covalued in a derivation  $D$ , if
- $\alpha$  is in a configuration to A-bind  $\beta$ , and
  - $\alpha$  cannot A-bind  $\beta$  in  $D$ , and
  - The covaluation interpretation is indistinguishable from what would be obtained if  $\alpha$  A-binds  $\beta$ .

As indicated above, this is exactly the case of (30b).

## 5. Conclusion

Departing from constraints on QNP-pronominal binding in Russian, we pointed at one property of this type of dependency that is very stable cross-linguistically and that is shared by anaphor binding. This property is as follows: the interpretation of a pronominal/anaphor as a bound variable may be possible at different stages of the derivation: the overt form or some reconstructed stage (28), though binding may be further constrained with respect to the position of the antecedent (cf. constraints on QR and language-specific versions of Condition A). This property of bound anaphora opposes it to other cases of coindexing – for example, those regulated by Condition C. We presented the theory of reconstruction that explains this contrast. This theory is based on the ideas of D. Fox and T. Reinhart. It states that the structure created by movement can be interpreted in several ways depending on different factors. Importantly, it was argued that reconstruction as such (higher copy deletion) applies only for binding/scope reasons. It was shown that the generalization (28) holds just because the interpretative mechanisms cannot work in a way incompatible with this generalization.

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## **Double Definiteness Constructions in Colloquial Bulgarian**

### **1. Introduction**

This paper discusses the possibility of placing two definite determiners within the same noun phrase in colloquial Bulgarian. Three patterns of double definiteness constructions are attested – when the demonstrative co-occurs with the definite article, what I will call Dem+Art construction, and when two definite articles co-occur within the same phrase, one attaching to a possessive and another to an adjective following the articulated possessive or, in the third case, one attaching to a numeral and another to an adjective following the articulated numeral. I will analyze the first type in more detail and then I will extend the analysis to the other two constructions.

### **2. The Double Definiteness Constructions in Bulgarian. Data**

The double definiteness constructions differ from the standard Bulgarian noun phrase in terms of their syntax, semantics and phonology. I am going to analyze all these aspects below. In this section, I am going to present the data.

First, we are going to have a detailed look at the Bulgarian Dem+Art construction, which is the most frequent double definiteness construction. Below, I present some restrictions on the second element of the double definiteness constructions.

#### **2.1. The Dem+Art Construction**

I discuss below the restrictions on the types of adjectives that can enter this construction. The definite article co-occurring with the demonstrative can appear on adjectives, as shown in (1).

- (1)     *onaia zelenata bluza*  
          that green-the blouse  
          “that green blouse”

The definite article can also occur on a possessor and on a numeral.

(2) *onia moite teniski*  
 those my-the T-shirts  
 “those my T-shirts”

(3) *onia trite stola*  
 those three-the chairs  
 “those three chairs”

There are native speakers who accept the definite article also on quantifiers like *niakolko/some, mnogo/many*.

(4) *onia mnogoto/niakolkoto knigi (tam)*  
 those many-the/some-the books (there)  
 “those books of which there are a lot/of which there is some number”

The occurrence of the article on the quantifier *vsichki/all* is analyzed in a different way (see Dimitrova-Vulchanova & Giusti, 1996) and I will not dwell upon this here.

The adjective carrying the definite article can, according to some speakers, (rather marginally) be followed by the possessive clitic.

(5) *??onia zelenite mu obuvki*  
 those green-the his-CL shoes  
 “those green shoes of him”

The Bulgarian correspondent of the English indefinite article - *edin/one* cannot appear in the Dem+Art construction. (It is quite a controversial issue whether this element is a real indefinite article or something else. I will leave this issue open here.)

(6) *\*onia ediniat stol*  
 that one-the chair

The adjective holding the article in the Dem+Art construction can be modified by the degree quantifier, the comparative degree seems to be more admissible.

(7) *onaia po-visokata kushta*  
 that more high-the house  
 “that house that is higher (than the rest of the houses)”

- (8) *??onaia nai-visokata kushta*  
 that most high-the house  
 “that house that is the highest (of all)”

Some adjectives modified by adverbs can appear in the Dem+Art construction.

- (9) *onaia tumno zelenata kushta*  
 that dark green-the house  
 “that dark green house”

It seems that adjectives with a complement cannot enter the Dem+Art construction.

Unlike English, Bulgarian allows for adjectival complements in prenominal position but as (10) shows, the adjectives with complements cannot enter the double definiteness construction.

- (10) *\*onazi gordata s dushteria si maika*  
 that proud with daughter her mother

All examples with the asterisk above are perfectly possible if the Dem+Art construction is not used.

The modifiers *mnogo/many, very, tolkova/so* are unacceptable either in the Dem+Art construction or as simple modifiers of articulated adjectives outside the Dem+Art construction. They are usually used in indefinite noun phrases.

- (11) *\*onova mnogo krasivoto momiche*  
 that very beautiful-the girl

- (12) *\*mnogo krasivoto momiche*  
 very beautiful-the girl

- (13) *\*onova mnogo krasivo momiche*  
 that very beautiful girl

## 2.2. The Co-occurrence of Two Definite Articles

Two definite articles can co-occur if the first word which holds the article is a possessive or a numeral and the second is an adjective or another kind of element. I will look at both of these cases here, in order to see what combinations this type of structure allows for.

If the place of the demonstrative, in the above examples, is occupied by a possessive, the following element, as I said, can be a simple adjective:

- (14) *negovite starite obuvki*  
 his-the old-the shoes  
 “his old shoes”

If the possessive is followed by the numeral, the examples seem more marginal:

- (15) *?neinite dvete knigi*  
 her-the two-the books  
 “her two books”

Unlike the demonstrative, the possessive cannot be followed by quantifiers like *niakolko/some*, *mnogo/many*.

- (16) *\*neinite mnogoto/niakolkoto knigi tam*  
 her-the many-the/some-the books there

Examples in which the possessive is followed by *edin* seem very marginal.

- (17) *???Neinia edinia uchebnik*  
 her-the one-the textbook

Neither is it possible to combine the possessive with an adjective followed by the possessive clitic.

- (18) *\*neinia zelenia I pantaloon*  
 her-the green-the her-CL trousers

The possessive can marginally be followed by a comparative degree adjective.

- (19) *??moita po-dulgata pola*  
 my-the more long-the skirt

An adjective modified by an adverb can enter the double definiteness construction:

- (20) *moita tumno siniata pola*  
 my-the dark blue-the skirt  
 “my dark blue skirt”

The rest of the cases I mentioned in relation to the demonstrative – the superlative degree adjective, the adjective followed by a complement, the adjectives modified by *mnogo/very, many, tolkova/so* are impossible with a possessive.

If the first articulated position is occupied by a numeral, the second one can be occupied only by an adjective, marginally by a simple adjective modified by the comparative form of the degree modifier and also marginally by an adjective modified by an adverb.

- (21) *dvete niskite kushti*  
two-the low-the houses  
“the two low houses”
- (22) ??*dvete po-niskite kushti*  
two-the more low-the houses  
“the two lower houses”
- (23) ??*dvete tumno zelenite rizi*  
two-the dark green-the shirts  
“the two dark green houses”

### 2.3. Dislocation of the second element of the double definite construction

An important characteristic of the Bulgarian adjectives is that they can occur only prenominally. Normally no adjective is allowed to appear after the noun. Interestingly, this rule does not hold for the second articulated element in the double definite construction.

- (24) *Predpochitam da si kupia onaia roklija, zelenata.* (Dem+Art)  
prefer (I) to buy that dress green-the  
“I prefer to buy that green dress”
- (25) *Poveche mi haresva neinata roklija, zelenata.* (Poss+Adj)  
more to me appeals her dress green-the  
“I like more her dress, the green one”
- (26) *Bihte li mi pokazali dvete kutii ot vitrinara,*  
would (you)me show two-the boxes from shop window-the  
*zelenite.* (Num+Adj)  
green-the  
“Could you show me the two boxes from the shop window, the green ones.”

- (27) *Onaia roklija mi haresva nai-mnogo, zelenata.*  
 that dress to me appeals most green-the  
 “That dress I like most, the green one.”

The second articulated element from the Dem+Art construction could be also fronted to a DP initial position, an option not available for the normal adjective.

- (28) *zelenata onaia roklija* (Dem+Art)  
 green-the that dress  
 “that green dress”

This dislocation is not allowed in the constructions containing two definite articles and no demonstrative.

- (29) \**zelenata neinata bluza*  
 green-the her-the blouse

- (30) \**sinite dvete bluzi*  
 blue-the two-the blouses

In conclusion, we could say that of the three double definiteness constructions the Dem+Art construction is the most productive one. The demonstrative combines with various other elements and allows both DP initial and DP final positions. The possibility of the possessive and the numeral to combine with other words, forming a double definite construction is more limited. The constructions introduced by these elements do not allow fronting of the second element.

### 3. Semantic Analysis

What the three double definiteness constructions have in common is the interpretation of the second element. In all three constructions, this element holds the definite article and, notice, has a restrictive interpretation. In other words, by means of the articulated second element all three constructions convey the meaning of selecting one concrete referent.

Depending on the context, the Dem+Art construction could refer to an entity either anaphorically or deictically. As we will see below, the entity is not necessarily selected from among other entities. Neither is it necessarily isolated on the basis of the quality denoted by the adjective. It is described as unique just by the deictic or by the anaphoric use of the definite article.

### 3.1. Anaphoric Interpretation

Neither in (31) nor in (32) is the green blouse necessarily the only blouse of this color. The difference is that in (32) the blouse is identified as unique anaphorically, not on the basis of the meaning carried by the adjective<sup>1</sup>, i. e. in this case the color. In other words, the restriction signaled by the definite article in this sentence is understood as *that blouse that I showed you when we were in the shop*. The quality denoted by the adjective *can*, but does not necessarily take part in the restriction. Thus, to identify the entity, the hearer receives the information about the quality of the adjective. If this quality is unique, the hearer identifies the object on the basis of it. If this quality is not unique in the situation, the hearer searches for an object which is common knowledge to him/her and the speaker.

- (31) *Onaia zelena bluza, koiato prodavachkata izvadi*  
 That green blouse that shop assistant-the took out  
*ot shkafa, ne beshe losha.*  
 of wardrobe not was bad.  
 “That green blouse the shop assistant took out of the wardrobe was not bad.”

- (32) *Onaia zelenata bluza, koiato prodavachkata izvadi*  
 That green-the blouse that shop assistant-the took out  
*ot shkafa, ne beshe losha.*  
 of wardrobe not was bad.  
 “That green blouse the shop assistant took out of the wardrobe was not bad.”

Another interesting observation is that in (31), the relative clause introduced by the relative pronoun *koiato* could be either restrictive or non-restrictive. In (32), the relative clause introduced by the same relative pronoun can only be non-restrictive. This is another piece of evidence showing that there *is* already one restrictive element inside the matrix clause of (32).

### 3.2. Deictic Interpretation

The following example displays the deictic meaning of the Dem+Art construction.

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1 The meaning of the adjective could also play a role in identifying the entity. This is not excluded. Our purpose is to say that this is not the crucial element which creates the contrast on the basis of which the entity is selected.

- (33) *Onaia zelenata bluza kolko struva?*  
 That green-the blouse how much costs  
 “How much does the green blouse over there cost?”

To facilitate the interpretation, we have to imagine again that we are in a shop. This time we are pointing at a blouse asking about its price. Again, the blouse we are pointing at is singled out as unique and again it is not obligatorily the case that this blouse is the only green blouse in the shop. The adjective holding the definite article is restrictive. The restrictive meaning is interpreted here as *the blouse I am pointing at*.

The semantic analysis of the other two double definiteness constructions is very similar to the analysis of the Dem+Art construction. The only difference is that the place of the demonstrative is taken by the possessive or the numeral.

#### 4. Phonological characteristics

The double definiteness constructions exhibit also some phonological differences when compared to the standard Bulgarian noun phrase. Namely, a short pause is left between the demonstrative (or the first articulated element) and the second element. Also, a slight resuming of the intonation is needed so that the colloquial construction would sound good. No such pause and resuming of the intonation are noticed with the pronunciation of a standard Bulgarian phrase.

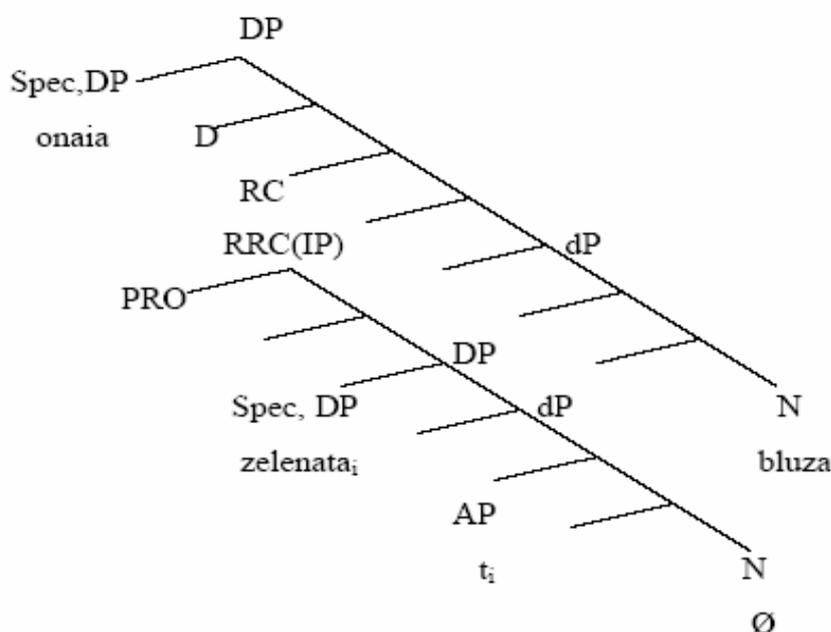
#### 5. Syntactic analysis

I will start the syntactic analysis by looking at the position of the highest element of the double definiteness constructions. In the Dem+Art construction this is the demonstrative and in the other two constructions, the position of the highest element is occupied by the articulated possessive or numeral.

As I have already mentioned above, the demonstrative in Bulgarian occupies the highest position in the DP – the Spec,DP. According to Dimitrova-Vulchanova and Giusti (1996), the articulated adjectives in Bulgarian also occupy the Spec,DP position. This would mean that the demonstrative cannot co-occur with an element holding the definite article of the whole DP, unless that element occupies some other position in the phrase. Going back to the semantic analysis of the constructions at issue, we see that the meaning of the second element in all three constructions corresponds in meaning to the indirect modification adjectives of Cinque’s (2005) classification, because it has a clearly restrictive interpretation. According to Cinque’s (2005) theory of adnominal modification, the restrictive interpretation is a signal of the predicative origin of the adjective. Further, Cinque (2003) claims that the relative clause is merged in

front of the noun, which means that the prenominal position is the merge position of the proposed relative clause (be it a full clause or a reduced relative clause) and not a position reached by movement. I will argue that the element carrying the article in the Bulgarian double definiteness constructions does not occur prenominally as a main predicate of a relative clause but as a modifier of a null N. I present below the structure of the double definiteness constructions.

- (34) a. *onaia zelenata bluza*  
 that green-the blouse  
 “that green blouse”  
 b.



Before analyzing the tree, I would like to say a few words about the other two double definiteness constructions – the one in which the highest element is a possessive and the other in which the highest element is the numeral. In case the DP contains no demonstrative, the definite article is attached to the first adjective (be it a possessive or a numeral). According to the analysis of Dimitrova-Vulchanova and Giusti (1996), this element, once articulated, moves to Spec,DP. Again, since Spec,DP is a unique position inside the noun phrase, a second articulated adjective appears to be an odd element inside the phrase. In this paper, I analyze the second articulated adjective in the same way as the second articulated element in the Dem+Art construction (see the tree diagram in 34b).

In the tree diagram above, D takes as a complement a functional projection whose specifier hosts the relative clause. The reduced relative clause (which is relevant to our discussion) is situated still lower. The reduced relative clause, in our tree diagram, which is an IP, contains a DP predicate. The adjectives

within this DP obey the same rule of raising to Spec,DP when taking the article (we will see below what restrictions exist on the types of adjectives that can enter the reduced relative clause). Going down the tree, we notice also the small dP present both in the reduced relative clause and along the main branch. The small dP corresponds to the head of the relative clause. The small dP on the main branch of the tree contains the main head. The reduced relative clause contains an exact copy of the main head. Cross-linguistic evidence suggests that the reduced relative clause is situated lower than the Num node and higher than the adjectives.

As I mentioned above, the general rules the adjectives of the reduced relative clause obey are the same as those of the main DP – when taking the article the adjectives move up to Spec,DP. Still, not all adjectives can be used in the double definiteness constructions. Actually, the data show that all adjectives that can enter the Dem+Art construction allow for an empty N and if an adjective does not allow for an empty N, it cannot enter this construction. Thus, only those Bulgarian adjectives which allow an empty N can be used in the constructions at issue. This condition does not pose any restriction on their attributive or predicative origin. In other words, both adjectives from attributive and adjectives from predicative source can enter the Dem+Art construction. The fact that an attributive-only adjective can enter a predicative structure already suggests that this adjective cannot be the main predicate of the IP but is necessarily a part of a DP predicate.

One important characteristic of the articulated adjective is that it places the entity in relation to other entities. This is a test first proposed by Babby (1970), used also by Siegel, quoted also in Cinque (2005).

If we apply the test to an adjective which has also a predicative use, the result we get is the same.

(35) *Neinata roklija e zelena*  
 her dress is green  
 “Her dress is green”

(36) *Neinata roklija e zelenata*  
 her dress is green-the  
 “Her dress is the green one.”

The two examples above form a minimal pair. The adjective in the first example is a real predicate. It says that dress is green in absolute terms. The second example has a different meaning. It selects a dress from among other dresses. This is exactly the meaning we get when the adjective is used prenominaly, inside the double definiteness construction. These considerations also suggest

that the articulated adjective is actually a part of a DP predicate and not an ordinary adjective.

Another piece of evidence comes from the possibility of the articulated adjective to move freely out of the DP, which was discussed earlier. I repeat here one of the examples presented above.

- (37) *Onaia roklija mi haresva nai-mnogo, zelenata.*  
 that dress to me appeals most green-the  
 “That dress I like mostly, the green one.”

If the predicate were a simple adjective, it would not be able to appear alone, as is shown by the following example.

- (38) \**Edna roklija mi haresa mnogo, zelena.*  
 one dress to me appealed much, green

The speaker would prefer to use a whole DP, instead of an adjective.

- (39) *Edna roklija mi haresa mnogo, edna zelena.*  
 one dress to me appealed much, one green  
 “One dress appealed to me a lot, a green one.”

As I mentioned above, a crucial piece of evidence suggesting that the articulated second element is a whole DP predicate is the possibility of attributive-only adjectives to enter the double definiteness constructions, of course, followed by an empty N. Adjectives like the ones presented in (40) can be used in predicative position only when articulated.

- (40) *predishniat/ previous-the/ "the previous"*  
*sledvashtiat/ following-the/ "the previous"*  
*bivshiat/ ex-the "the former"*  
*noviat/ latest-the/ "the latest"*  
*stariat/ previous-the/ "the previous"*
- (41) *Onaia predishnata magazinierka raboteshe po-dobre.*  
 that previous-the shop assistant worked better  
 “That previous shop assistant worked better”
- (42) *Tia novite razporedbi sa po-prakticheski nasocheni.*  
 these new-the (=latest) decrees are more practically oriented  
 “The last decrees are more practically oriented”

Notice that the adjective *nov/new*, *latest* could have both an attributive and a predicative meaning. In the Dem+Art construction in (42), it is used with its attributive meaning, not with its predicative meaning. The meaning *latest* cannot be realized if the adjective takes the place of a predicate.

- (43) \**tia razporedbi sa novi (=latest)*  
 these decrees are new

As suggested by the semantic analysis, the syntactic structure of the other two double definiteness constructions is expected to be the same. The only difference would be that the place of the demonstrative would be occupied by an articulated adjective.

## 6. Similar phenomena in other languages

In this section, I am going to discuss some similar phenomena attested in other languages. One such phenomenon is the Greek “Determiner Spreading”.

### 6.1. The Case of Greek. Determiner Spreading

Greek is similar to Bulgarian in that all adjectives are used prenominally, when definite and non-articulated. The adjectives in the Greek definite noun phrase can either occur with or without the article. When preceded by the definite article (i.e. articulated) they can either precede or follow the noun, while, if articleless, they can only appear prenominally.

- (44) to megalo vivlio (Campos & Stavrou. 2004)  
 the big book  
 “the big book”

- (45) \*to vivlio megalo  
 the book big  
 “the big book”

- (46) to megalo to vivlio  
 the big the book  
 “the big book”

Building on other authors, Cinque (2005) argues that the articulated adjectives, to which is applied the notion of “Determiner Spreading”, are from a predicative source. This would mean that these adjectives originate as predicates of relative

clauses. In adnominal, position these adjectives occur, according to Cinque (2005), as reduced relative clauses. Cinque's claim is supported by the following arguments.

Only those adjectives which can be used as predicates can occur articulated. Non-predicative adjectives cannot occur articulated. Moreover, the adjectives preceded by the definite article are always restrictive, which, as we saw above, is a characteristic of the predicative source adjectives. If an adjective is non-restrictive it cannot be preceded by an article. The adjectives preceded by the article have an intersective interpretation while the non-articulated adjectives are ambiguous between an intersective interpretation and a non-intersective interpretation. Also, the articulated adjectives do not show ordering restrictions while the non-articulated ones are rigidly ordered. Articulated adjectives are always situated higher than non-articulated ones. The predicative form is supposed to appear outside the attributive adjective.

From the considerations presented above it follows that the articulated adjectives in Greek are, unambiguously, adjectives from a predicative source, while non-articulated adjectives are practically ambiguous. Bulgarian differs from Greek in that the articulated adjective we find in prenominal position in Bulgarian is not in itself a predicate of a relative clause but is rather a modifier of a null N within a larger DP predicate. Thus, what we find in prenominal position in Bulgarian is a whole DP predicate of a reduced relative clause.

## 6.2. Bosnian/Croatian/Serbian

Bosnian/Croatian/Serbian is another instance of a language which distinguishes between a short form and a long form of the adjective. The data suggest that in the case of Bosnian/Croatian/Serbian, the short form is only predicative, while the long form is only attributive. I present now the considerations that lead to this conclusion.

Both the long and the short forms can occur preminally but in predicate position only the short form is possible. This is taken to mean that the short form is of a predicative source. I present below some examples cited in Cinque (2005).

(47) *nov*                      *kaput*  
new (short form) coat  
“a new coat”

(48) *novi*                      *kaput*  
new (long form) coat  
“the/a new coat”

- (49) *Njegov kaput je nov/\*novi.*  
 his coat is new (short form)/new\* (long form)  
 “His coat is new.”

The short-form adjectives used in adnominal position can be interpreted only intersectively, they cannot have idiomatic meaning, unlike long-form adjectives which can.

- (50) *slijepi miš* (Leko 1992, cited in Cinque 2005)  
 blind (long form) mouse  
 “bat”

- (51) *slijep miš* (Leko 1992, cited in Cinque 2005)  
 blind (short form) mouse  
 “a blind mouse”

Apart from that, long-form adjectives are strictly ordered while short-form adjectives in adnominal position do not display any order, as we see in the examples below.

- (52) *pouzdana<sub>short</sub> malo<sub>short</sub> crno<sub>short</sub> auto* (Aljović 2000, cited in  
 “a reliable small black car” Cinque 2005)

- (53) *crno<sub>short</sub> pouzdano<sub>short</sub> malo<sub>short</sub> auto* (Aljović 2000, cited in  
 “a black reliable small car” Cinque 2005)

Adjectives that do not have a predicative use do not have a short-form either.

- (54) *navodni/\*navodan komunista* (Aljović 2000, cited in  
 an alleged (long-form/\*short-form) communist Cinque 2005)  
 “an alleged communist”

- (55) *budući/\*buduć predsjednik* (Aljović 2000, cited in  
 the future (long-form/\*short-form) president Cinque 2005)  
 “the future president”

Finally, if both a short-form and a long-form adjective co-occur prenominaly, the short-form adjective necessarily precedes the long-form adjective.

- (56) *siromašan bolesni dječak* (Leko 1988, cited in  
 a/the poor (short-form) sick (long-form) boy Cinque 2005)  
 “a/the poor sick boy”

- (57) \**bolesni siromašan dječak* (Leko 1988, cited in  
sick (long-form) poor (short-form) boy Cinque 2005)

The data clearly show that the short-form adjectives have a predicative origin. Nevertheless, this language differs from Bulgarian because, as in the Greek case, the adjectives from a predicative source are analyzed as main predicates.

### 6.3. Russian

Russian makes use of a similar distinction. Russian also uses short-form and long-form adjectives. It exhibits, however, some significant differences, in comparison with Bosnian/Croatian/Serbian. First of all, Russian short-form adjectives cannot be used in adnominal positions. Long-form adjectives, on the other hand, can be used either in adnominal position or in predicate position.

- (58) \**nov/novi dom stoit nagore* (Pereltsvaig 2000)  
new<sub>NOM</sub>(\*SHORT/LONG) house<sub>NOM</sub> stands onhill

- (59) *dom nov/novyj* (Pereltsvaig 2000)  
house<sub>NOM</sub> new<sub>NOM</sub>(SHORT/LONG)  
“The house is new.”

Building on Siegel, Cinque (2005) analyses Russian adjectival occurrences in the following way. Long-form adjectives can be derived not only from an attributive but also from a predicative source. In other words, if a predicative adjective occurs in adnominal position it necessarily takes the long form. Cinque supports this analysis with the fact that adnominal participles, which for sure derive from relative clauses, take on the long-form as well.

- (60) *Ivan byl ubit* (Bailyn 1994)

Ivan was killed(SHORT)  
“Ivan was killed.”

- (61) *Ubityj soldat ležal na zemle* (Bailyn 1994)

killed(LONG) soldier lay on ground  
“The killed soldier lays on the ground.”

Since all prenominal adjectives in Russian take on the long form, Russian does not exhibit the difference between attributive and predicative adjectives in prenominal position. As to the empty category, neither in Russian is there evidence that the predicative adjective takes a null noun. Therefore, according to the considerations presented above, Russian does not pattern with Bulgarian

either. There is, however, one language that exhibits very similar properties and this is Slovenian.

#### 6.4. TA in colloquial Slovenian

Slovenian, at least standard Slovenian, has no articles just like the neighbouring Slavic languages. The colloquial language, however, makes use of an article-like element (as Marušič and Žaucer 2006 call it) TA. TA is homophonous with the demonstrative but still differs from it, as shown by Marušič and Žaucer (2006). According to their analysis, TA introduces a predicative construction in prenominal position. The authors present evidence that, in some cases the prenominal predicative construction introduced by TA contains an empty category. These are cases in which the so called “contrastive reading” is present. Notice the semantic contrast between the following two sentences.

- (62) *Moj bivši mož je pjanc.* (Marušič and Žaucer 2006)  
 my former husband is drunkard  
 “My former husband is a drunkard.”
- (63) *Moj ta bivši mož je pjanc.* (Marušič and Žaucer 2006)  
 my TA former husband is drunkard  
 “My former husband is a drunkard.”

In the first example above, it is not presupposed that the speaker has married again. In the second example, it is clear that the speaker has another husband at the moment of uttering the phrase. Very similar is the case of the following example:

- (64) *Poklical smo ta gorskega reševalca (ne ta pomorskega.)*  
 called AUX TA mountain rescuer (not TA coastal).  
 “We called the mountain rescuer (not the coastal one.)”  
 (Marušič and Žaucer 2006)

The contrastive element can be clearly seen and its presence implies the presence of an empty category as well. The data from Slovenian show that this language seems more similar to Bulgarian than all the other examples of similar phenomena, which I enumerated earlier. In both languages, the colloquial language makes use of a predicative structure in prenominal position. Furthermore, both languages make use of a construction, whose adjective modifies a null noun. The semantic similarity between Bulgarian and Slovenian is that the adjective following TA is interpreted restrictively (what the authors call “contrastive reading”). The same is true for the Bulgarian double definiteness con-

structions. The syntactic similarity between the two languages concerns the predicative phrase analysis which Marušič and Žaucer (2006) offer and the reduced relative clause analysis of the Bulgarian double definiteness constructions offered in this paper. The difference is probably that, in Slovenian, as the data seem to show, the empty category is present exclusively with attributive adjectives, while in the Bulgarian double definiteness constructions both attributive and predicative adjectives are allowed, the condition being that the adjective in question allows for an empty category and has a contrastive interpretation.

## 7. Conclusion

In this paper, I discussed three double definiteness phenomena in colloquial Bulgarian. I claimed that the articulated adjective following the demonstrative or the first articulated element does not hold the article of the whole DP. On the basis of the semantic, syntactic and phonological considerations, I concluded that the second definite element occurs inside a reduced relative clause in prenominal position. I showed, however, that the articulated adjective does not seem to be the main predicate of the reduced relative clause. The predicate is rather a whole DP in which the articulated adjective is a modifier of a null noun. Comparing Bulgarian to other languages which display similar predicative constructions, namely Greek, Bosnian/Croatian/Serbian and Russian, I concluded that Bulgarian differs from those languages in that it uses the prenominal articulated adjective as a modifier in a DP predicate, in which it modifies a null noun. We have seen that there is another Slavic language, namely Slovenian, which displays a phenomenon that closely resembles the structure of the Bulgarian double definiteness constructions.

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## Functional Generative Description, Restarting Automata and Analysis by Reduction\*

### 1. Introduction

Functional Generative Description (FGD) is a dependency based system for Czech, whose beginnings date back to the 1960s (see esp. Sgall *et al.* 1969, Sgall *et al.* 1986). FGD may be of some interest for the description of most Slavic languages, since it is adapted to treat a high degree of *free word order*. It not only specifies surface structures of the given sentences, but also translates them into their underlying representations. These representations (called tectogrammatical representations, denoted TRs) are intended as an appropriate input for a procedure of semantico-pragmatic interpretation in the sense of intensional semantics (see Hajičová *et al.* 1998). Since TRs are, at least in principle, disambiguated, it is possible to understand them as rendering linguistic (literal) meaning (whereas figurative meaning, specification of reference and other aspects belong to individual steps of the interpretation).

FGD has been implemented as a generative procedure by a sequential composition of pushdown automata (see Sgall *et al.* 1969, Plátek *et al.* 1978). Lately, as documented e.g. in Petkevič (1995), we have been interested in the formalization of FGD designed in a declarative way. In the present paper we want to formulate a formal framework for the procedure of checking the appropriateness and completeness of a description of a language in the context of FGD. The first step in this direction was introduced in Plátek (1982), where the formalization by a sequence of translation schemes is interpreted as an analytical system, and as a generative system as well. Moreover, requirements for a formal system describing a natural language  $L$  have been formulated – such a system should capture the following issues:

- The set of correct sentences of the language  $L$ , denoted by  $LC$ .
- The formal language  $LM$  representing all possible tectogrammatical representations (TRs) of sentences in  $L$ .
- The relation  $SH$  between  $LC$  and  $LM$  describing the ambiguity and the synonymy of  $L$ .

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\* This paper is a result of the project supported by the grants No. 1ET100300517 and MSM0021620838. The extended version is prepared for The Prague Bulletin of Mathematical Linguistics.

- The set of the correct structural descriptions  $SD$  representing in a structural way all possible TRs of sentences in  $L$  as dependency-based structures (*dependency trees*).

The object of the present paper concerns the foundations of a *reduction system* which is more complex than a reduction system for a (shallow) syntactic analyzer, since it provides not only the possibility of checking the well-formedness of the (surface) analysis of a sentence, but its underlying (tectogrammatical in terms of FGD) representation as well. Such a reduction system makes it possible to define formally the *analysis* as well as the *synthesis* of a sentence.

We propose here a new formal frame for checking FGD linguistic descriptions, based on *restarting automata*, see e.g. Otto (2006), Messerschmidt *et al.* (2006). We fully consider the first three requirements, i.e., *LC*, *LM* and *SH*. The fourth one is not formally treated here.

The main contribution of the new approach consists in the fact that it mirrors straightforwardly the so-called (*multi-level*) *analysis by reduction*, an implicit method used for linguistic research. Analysis by reduction consists of stepwise correct reductions of the sentence; roughly speaking, the input sentence is simplified until the so-called *core predicative structure* of the sentence is reached. It allows for obtaining (in)dependencies by the *correct reductions* of Czech sentences as well as for describing properly the complex word-order variants of a language with a high degree of 'free' word order (see Lopatková *et al.* 2005). During the analysis by reduction, a (disambiguated) input string is processed, i.e., a string of tokens (word forms and punctuation marks) enriched with metalanguage categories from all linguistic layers encoded in the sentence.

In Section 2., we provide a brief characterization of analysis by reduction (subsection 2.1.) and then we address two basic linguistic phenomena, dependency (subsection 2.2.) and word order (2.3.), and show the process of the analysis by reduction on examples from Czech.

Now, let us briefly describe the type of restarting automaton that we use for modeling analysis by reduction for FGD (see Section 3). A *4-LRL-automaton*  $M_{FGD}$  is a non-deterministic machine with a finite-state control  $Q$ , a finite characteristic vocabulary  $\Sigma$  (see below), and a head (window of size 1) that works on a flexible tape. The automaton  $M_{FGD}$  performs:

- *move-right* and *move-left steps*, which change the state of  $M_{FGD}$  and shift the window one position to the right or to the left, respectively,
- *delete steps*, which delete the content of the window, thus shortening the tape, change the state, and shift the window to the right neighbor of the symbol deleted.

At the right end of the tape,  $M_{FGD}$  either halts and *accepts* the input sentence, or it halts and *rejects*, or it *restarts*, that is, it places its window over

the left end of the tape and reenters the initial state. It is required that before the first restart step and also between any two restart steps,  $M_{FGD}$  executes at least one delete operation.

The 4-LRL-automata can be also represented by a final set of so called metarules (see Messerschmidt *et al.* 2006), a declarative way of representation, which seems to be a very promising tool for natural language description.

The basic notion related to  $M_{FGD}$  is the notion of the language accepted by  $M_{FGD}$ , so called *characteristic language*  $L_{\Sigma}(M_{FGD})$ . In our approach, it is considered as a language that consists of all sentences from the surface language  $LC$  over alphabet  $\Sigma_0$  enriched with metalanguage information from  $\Sigma_1, \Sigma_2, \Sigma_3$ . The tectogrammatical language  $LM$  as well as the relation  $SH$  can be extracted from  $L_{\Sigma}(M_{FGD})$ .

In order to model the analysis by reduction for FGD, the 4-LRL-automaton  $M_{FGD}$  works with a complex characteristic vocabulary  $\Sigma$  that is composed from (sub)vocabularies  $\Sigma_0, \dots, \Sigma_3$ . Each subvocabulary  $\Sigma_i$  represents the corresponding layer of language description in FGD, namely:

- $\Sigma_0$  is the set of Czech written *word-forms* and *punctuation marks* (tokens in the sequel), it is the vocabulary for the language  $LC$  from the request 1 above;
- $\Sigma_1$  represents the *morphemic layer* of FGD, namely morphological lemma and tag
- for each token;
- $\Sigma_2$  describes surface syntactic functions (as e.g., Subject, Object, Predicate);<sup>1</sup>
- $\Sigma_3$  is the vocabulary of the *tectogrammatical layer* of FGD describing esp. 'deep' roles, valency frame for frame evoking words, and meaning of morphological categories.

That means that the automaton has an access to all the information encoded in the processed sentence (as well as a human reader/linguist has all the information for his/her analysis).

$M_{FGD}$  was introduced with no ambitions to model directly the procedure of the sentence-generating in the human mind or of the procedure of understanding performed in the human mind. On the other hand, it has a straightforward ambition to model the observable behavior of a linguist performing *analysis by reduction* of Czech sentences on the blackboard or on a sheet of paper.

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1 Note that the layer of surface syntax does not correspond to any layer present in the theoretical specification of FGD, but rather to the auxiliary 'analytical' layer of the Prague Dependency Treebank, see Mikulová *et al.* (2005), which is technically useful for a maximal articulation of the process of analysis.

## 2. Analysis by Reduction for FGD

In this section we focus on the analysis by reduction for Functional Generative Description. After a brief characterization of analysis by reduction (subsection 2.1.), we address two basic linguistic phenomena, dependency (subsection 2.2.) and word order (2.3.), and illustrate the process of the analysis by reduction on examples from Czech.

### 2.1. Analysis by Reduction

The analysis by reduction makes it possible to formulate the relationship between dependency and word order (see also Lopatková *et al.* 2005). This approach is indispensable especially for modeling the syntactic structure of languages with a high degree of ‘free’ word order, where the dependency (predicate-argument) structure and word order are very loosely related. The restarting automaton  $M_{FGD}$  that models analysis by reduction for FGD is specified in detail in the Section 3.

The *analysis by reduction* is based on a stepwise simplification of a sentence – each step of analysis by reduction consists of deleting at least one word of the input sentence (see Lopatková *et al.* 2005 for more details).<sup>2</sup> The following principles must be satisfied:

- preservation of syntactic correctness of the sentence;
- preservation of the lemmas and sets of morphological categories;
- preservation of the meanings/senses of the words in the sentence (represented e.g. as an entry in a (valency) lexicon);
- preservation of the ‘completeness’ of the sentence (in this text only valency complementations (i.e., its arguments/inner participants and those of its adjuncts/free modifications that are obligatory) of frame evoking lexical items must be preserved).

The analysis by reduction works on a sentence (string of tokens) enriched with metalanguage categories from all the layers of FGD – in addition to word forms and punctuation marks, it embraces also morphological, surface and tectogrammatical information.

The input sentence is simplified until the so called *core predicative structure* of the sentence is reached. The core predicative structure consists of:

- the governing verb (predicate) of an independent verbal clause and its valency complementations, or
- the governing noun of an independent nominative clause and its valency complementations, e.g., *Názory čtenářů*. [Readers' opinions.], or

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2 Here we work only with the deleting operation whereas in Lopatková *et al.* (2005) the rewriting operation is also presupposed.

- the governing word of an independent vocative clause, e.g., *Jano!* [Jane!],  
or
- the governing node of an independent interjectional clause, e.g., *Pozor!* [Attention!].

## 2.2. Processing dependencies

Czech is a language with a high degree of so-called free word order. Naturally, (surface) sentences with permuted word order are not totally synonymous (as the word order primarily reflects the topic-focus articulation in Czech), but their grammaticality may not be affected and the dependency relations (as binary relations between governing and dependent lexical items) may be preserved regardless of the word order changes. This means that the identification of a governing lexical item and its particular complementations is not based primarily on their position in the sentence but rather on the possible order of their reductions.

There are two ways of processing dependencies during the analysis by reduction.

- Free modifications (i.e., adjuncts) that do not satisfy valency requirements of any lexical item in the sentence are deleted one after another, in an arbitrary order (sentence (1)).
- The so called reduction components (formed by words that must be reduced together to avoid non-grammaticality, i.e., incompleteness of tectogrammatical representation)<sup>3</sup> are processed ‘en bloc’ depending on their function in the sentence:
  - Either all members of the reduction component are reduced – this step is applied if the ‘head’ of the reduction component does not fulfill any valency requirements of any lexical item in the sentence (see sentence (2) below where the whole component represents optional free modification).
  - Or (if the ‘head’ of the reduction component satisfies the valency frame of some lexical item):
    - (i) the item representing the ‘head’ is simplified – all the symbols apart from the functor<sup>4</sup> are deleted; the result of such a simplification can be understood as a zero lexical realization of the respective item, see sentence (3) below;

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3 Typically, a reduction component is composed of a frame evoking lexical item together with its valency complementations, see Lopatková *et al.* (2005). Let us stress here that a reduction component may constitute a discontinuous string.

4 A functor is the label for syntactico-semantic relation holding between the respective item and its governing lexical item.

- (ii) the complementation(s) of the 'head' of the reduction component is/are deleted.

**Convention:** For the sake of clarity we have adopted the following conventions for displaying examples:

- Each column contains a symbol from one part of the (partitioned) vocabulary, that means information on one layer of FGD:<sup>5</sup>
  - the first column contains tokens,
  - the second column contains morphological lemmas (m-lemmas) and morphemic values (i.e., morphological categories),
  - the third column contains (surface) syntactic functions,
  - for autosemantic words,<sup>6</sup> the fourth column contains tectogrammatical lemmas (t-lemmas), functors, frame identifiers and other tectogrammatical categories (so called grammatemes).
- Each individual token and its metalanguage categories are located:
  - in one line if its surface word order position agrees with the deep word order (i.e., word order at the tectogrammatical layer), or the token has no tectogrammatical representation (i.e., it is not an autosemantic word);
  - in two lines if its surface word order position disagrees with the deep word order:
    - (i) one line embraces the token, its m-lemma and morphemic values as well as its (surface) syntactic function, and
    - (ii) the other line contains relevant tectogrammatical information (for autosemantic words).
- The top-down ordering of lines reflects the word order on the respective layer.

Such a two-dimensional convention allows for revealing both (i) a representation of a whole sentence on particular layers (individual columns for particular layers), including relevant word order (columns 1, 2, 3 reflect the surface word order whereas column 4 is organized according to deep word order), and (ii) information relevant for individual tokens (rows).

Let us illustrate the processing of dependencies on the examples.

**Example:**

- (1) *Včera přišel domů pozdě.*  
 yesterday came home late  
 "Yesterday he came home late."

5 The standard notation used in the Prague Dependency Treebank is used, see Hajič (2005).

6 Function words have just functors or grammatemes as their tectogrammatical correlates that are assigned to their governing autosemantic words.

The analysis by reduction starts with the input string specified in Fig. 1. (see the convention above; the metalanguage categories are explained e.g. in Hajič 2005).<sup>7</sup>

<i>Včera</i>	<i>m-včera</i> .Dg- - -	Adv	<i>t-včera</i> .TWHEN [on].ACT
<i>přišel</i>	<i>m-přijít</i> .VpYS-	Pred	<i>t- přijít</i> .PRED.Frame1.ind-ant
<i>domů</i>	<i>m-domů</i> .Db- - -	Adv	<i>t-domů</i> .DIR3
<i>pozdě</i>	<i>m-pozdě</i> .Dg- - -	Adv	<i>t-pozdě</i> .TWHEN
.	..Z: - - -	AuxK	

Fig. 1. The input string for sentence (1).

It is obvious that an item of TR (an autosemantic word, see for Note 6) can have zero surface lexical realization (e.g., actor, ACT need not be realized, as Czech is a pro-drop language – the corresponding item is restored in the TR; also different kinds of ellipsis are possible). On the other hand, several word forms can constitute a single item of TR (as e.g., a prepositional group in sentence (2)).

Let us point out the difference between the two types of free modifications in the sentence, namely DIR3 (direction `to\_where') and TWHEN (temporal relation `when'): (i) whereas the valency complementation of direction DIR3 is considered to be obligatory for the verb *přijít* [to come] (the speaker as well as the listener must know this, see the dialogue test proposed in Panevová 1974) and thus fills the relevant slot of the valency frame of the verb (here marked by the label Frame1), (ii) the temporal relation TWHEN is an optional free modification (not belonging to the valency frame Frame1).

(2 steps) →

<i>přišel</i>	<i>m-přijít</i> .VpYS-	Pred	[on].ACT <i>t- přijít</i> .PRED.Frame1.ind-ant
<i>domů</i>	<i>m-domů</i> .Db- - -	Adv	<i>t-domů</i> .DIR3
.	..Z: - - -	AuxK	

Fig. 2. The reduced string – a core predicative structure for sentence (2).

The first step of analysis by reduction consists in the deletion of one of the optional free modifications *včera* [yesterday] or *pozdě* [late].<sup>8</sup> These free

7 We leave aside the problems of word order – this domain is briefly addressed in the following subsection.

8 More precisely, the tokens as well as all the metalanguage categories relevant for the particular lexical item are reduced, similarly in the sequel.

modifications may be reduced in an arbitrary order, they are mutually independent (see Lopatková *et al.* 2005). These reduction steps result in the string in Fig. 2.

Now, the sentence contains only one reduction component constituted by the finite verb and its valency complementations, i.e., its actor (expressed by a zero form of the pronoun) and its obligatory free modification DIR3 'to\_where', [*on*] *přišel domů* [(he) came home]. This is a core predicative structure, thus the reduction ends successfully.

### Example:

- (2) *Petr včera přišel do školy, kterou loni postavil minulý starosta.*  
 Peter yesterday came to school which last\_year built  
 previous mayor  
 "Yesterday Peter came to the school which was built last year by the previous mayor."

This example shows the reduction of the whole reduction component that consists of a dependent clause. The input string looks as in Fig. 3.

<i>Petr</i>	<i>m-Petr.NNMS1</i>	Sb	<i>t-Petr.ACT</i>
<i>včera</i>	<i>m-včera.Dg- -</i>	Adv	<i>t-včera.TWHEN</i>
<i>přišel</i>	<i>m-přijít.VpYS-</i>	Pred	<i>t- přijít.PRED.Frame1.ind-ant</i>
<i>do</i>	<i>m-do.RR- - 2</i>	AuxP	
<i>školy</i>	<i>m-škola.NNFS2</i>	Adv	<i>t-škola.DIR3.basic</i>
,	<i>„Z: - - -</i>	AuxK	
<i>kterou</i>	<i>m-který.P4FS4</i>	Obj	<i>t-který.PAT</i>
<i>loni</i>	<i>m-loni.Db- - -</i>	Adv	<i>t-loni.TWHEN</i>
<i>postavil</i>	<i>m-postavit.VpYS-</i>	Atr	<i>t-postavit.RSTR.Frame2.ind-ant</i>
<i>minulý</i>	<i>m-minulý.AAMS1</i>	Atr	
<i>starosta</i>	<i>m-starosta.NNMS1</i>	Sb	<i>t-starosta.ACT</i>
.	<i>..Z: - - -</i>	AuxK	<i>t-minulý.RSTR</i>

Fig. 3. The input string for sentence (2).

In the first three steps, the three optional free modifications *včera*, *loni* and *minulý* [yesterday, last\_year, previous] are deleted in arbitrary order.

Next, the whole component *kterou postavil starosta* [which the mayor built] consisting of the verb and its valency complementations is to be processed. As this component represents an optional adnominal free modification RSTR, it can be simply deleted without the loss of completeness.

After this step, only one reduction component *Petr přišel do školy* [Peter came to school] remains, which constitute a core predicative structure – the analysis by reduction ends successfully.

### Example:

- (3) *Petr pomáhal Marii uklízet zahradu.*  
 Peter helped Mary to clean garden  
 "Peter helped Mary to clean the garden."

In this example there is a valency complementation realized as an infinitive form of the verb *uklízet* [to clean] and its two valency complementations, *[ona]* [she] (non-expressed) and *zahradu* [garden].<sup>9</sup>

In order to obtain the core predicative structure, the following simplification of the reduction component is used: (i) the complementations *[ona]* [she] and *zahradu* [garden] of the head verb *uklízet* [to clean] are deleted and (ii) the word form *uklízet* [to clean] and all the categories relevant to this word form apart from its functor (here PAT, patient) are deleted – such a simplified item represents a (saturated) lexical item with zero morphemic form (and thus, the valency requirements remain satisfied).

This step results in the core predicative structure.

## 2.3. Word Order

A large effort has been devoted to clearing up the role of word order in so called free-word order languages, see e.g. Hajičová *et al.* (1998), Holan *et al.* (2000), Havelka (2005), and Hajičová (2006) for some of the most recent contributions for Czech.

Let us recall two basic principles for the tectogrammatical representation of FGD (see esp. Sgall *et al.* 1986 and Hajičová *et al.* 1998):

- The word order in TR (deep word order) reflects the topic-focus articulation – it corresponds to the scale of communicative dynamism (thus it may differ from the surface word order).
- The theoretical research assumes the validity of the principle of projectivity for TRs.

These two principles have important consequences for the analysis by reduction that models the transition from surface form of a sentence to its TR – the surface word order must be modified in order to obtain the deep word order (example (4)). This holds particularly for sentences with non-projective surface

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9 We leave aside the relation of control, i.e., a specific type of grammatical coreference between a complementation of a governing node and (non-expressed) subject of the infinitive verb.

structure (example (5)). It implies that the sentence representation must in general reflect two word orders, the surface and the deep one. Let us repeat here the adopted convention of displaying examples, particularly that for word order – whereas columns 1, 2, 3 depict surface word order, column 4, reflecting tecto-grammatical representation, reveals the deep word order.

**Example:** (see Mikulová *et al.* (2006), Section 10.3.1.)

- (4) *Černý kocour se napil ze své misky.*  
 black tomcat *refl* drunk from his bowl  
 "The black tomcat drank from its bowl."

Let us concentrate here on the topic focus articulation (see esp. Hajičová *et al.* 1998 and the writings quoted there).

According to Mikulová *et al.* (2006), the most general guideline of representing deep word order in TR is the placing of nodes representing contextually bound expressions to the left from their governing node and the placing of nodes representing contextually non-bound expressions to the right from their governing node. The contextual boundness is described in the attribute `tfa', the values `c' (contrastive topic), `t' (contextually bound) and `f' (contextually non-bound) belong to the metalanguage categories in the tecto-grammatical vocabulary. The input string for analysis is in Fig. 4 (the last category in the fourth column, divided by `\_', reflects tfa).

<i>Černý</i>	<i>m-černý.NNMS1</i>	Atr	
<i>kocour</i>	<i>m-kocour.NNMS1</i>	Sb	<i>t-kocour.ACT_t</i> <i>t-černý.RSTR_f</i> [Gen].PAT_t
<i>se</i>	<i>m-se.P7-X4</i>	AuxR	
<i>napil</i>	<i>m-napít.VpYS-</i>	Pred	<i>t-napít_se.PRED.Frame5_f</i>
<i>ze</i>	<i>m-z.RV- - 2</i>	AuxP	
<i>své</i>	<i>m-svůj.P8FS2</i>	Atr	[PersPron].APP_t
<i>misky</i>	<i>m-miska.NNFS2</i>	Adv	<i>t-miska.DIR1.basic_f</i>
.	<i>..Z: - - -</i>	AuxK	

Fig. 4. The input string for sentence (4).

The actor, ACT *kocour\_t* [tomcat] is contextually bound and it appears to the left of its governing verb *napil\_se\_f* [drank] in the surface; the contextually non-bound DIR1 complementation *misky\_f* [bowl] is to the right of its governing verb; and the contextually bound *svůj\_t* [his] is to the left from its governing word *miska\_f* [bowl] as well – the surface word order agrees in these cases with the deep word order.

On the other hand, the modification *černý\_f* [black] is contextually non-bound and it stands before its (bound) governing word *kocour\_t* [tomcat] – here the surface word order disagrees with the deep word order. This is the reason why the ordering in the last column (with the tectogrammatical representation) does not replicate the ordering of other columns – the contextually bound modification *černý\_f* [black] appears at the second position in the TR of the sentence (just behind the governing item *kocour\_t* [tomcat]).

Now, the reduction phase can start, i.e., a stepwise simplification of the sentence according to the principles of analysis by reduction, during which the dependencies are treated and the core predicative structure is obtained, as it is described in the previous subsection.

**Example:** (see Sgall *et al.* 1986, p. 241)

- (5) *Karla plánujeme poslat na rok do Anglie.*  
 Charles (we) plan to\_send for year to England  
 "Charles we are planning to send for a year to England."  
 ≈ As for Charles, we are planning to send him for a year to England.

The proper noun *Karla\_c* [Charles], which is the contrastive topic of a sentence ( $tfa = `c$ ), is moved away from its governing verb *poslat\_f* [to send], which causes a non-projectivity in the surface structure. The theoretical assumption of projectivity of TRs requires a different deep order – the corresponding item *t-Charles.PAT\_c* in TR is situated just before its governing item *t-poslat.PRED.Frame1\_f* [to send].

The analysis by reduction has the input string as in Fig. 5.

<i>Karla</i>	<i>m-Karel.NNMS4</i>	Obj	[my].ACT_t
<i>plánujeme</i>	<i>m-plánovat.VB-P-</i>	Pred	<i>t-plánovat.PRED.Frame6.ind-sim_f</i> <i>t-Karel.PAT_c</i> [my].ACT_t
<i>poslat</i>	<i>m-poslat.Vf- - -</i>	Obj	<i>t-poslat.PAT.Frame7_f</i>
<i>na</i>	<i>m-na.RR- - 4</i>	AuxP	
<i>rok</i>	<i>m-rok.NNIS4</i>	Adv	<i>t-rok.THL_f</i>
<i>do</i>	<i>m-do.RR- - 2</i>	AuxP	
<i>Anglie</i>	<i>m-Anglie.NNFS2</i>	Adv	<i>t-Anglie.DIR3.basic_f</i>
.	<i>..Z: - - -</i>	AuxK	

Fig. 5. The input string for sentence (5).

Now, the reduction phase treating the dependencies can start.

### 3. The 4-LRL-automata

In this section, the formal model for analysis by reduction for FGD is proposed. We use here the standard way of presentation from the theory of automata (our remarks should hopefully help readers not quite familiar with that kind of presentation). This section is partitioned into two subsections. The first one introduces *sRL-automata* – the basic models of restarting automata we will be dealing with. The important notion of metarules is introduced here; they serve for a more transparent, more declarative description of restarting automata.

The second subsection introduces *4-LRL-automata* as a special case of *sRL-automata*. A four-level *analysis by reduction system*, which is an algebraic representation of analysis by reduction, and the formal languages which represent the individual layers of FGD are introduced here, namely the languages of the first and the last level that correspond to the surface language *LC* and to the tectogrammatical language *LM* from Section 1. Further, the *characteristic relation*  $SH(M)$  is introduced.

Finally, the *SH-synthesis*, which models FGD as a generative device and specifies the generative ability of FGD, and *SH-analysis*, which fulfills the task of syntactico-semantic analysis of FGD, are introduced here step by step.

#### 3.1. The *t-sRL-Automaton*

Here we describe in short the type of restarting automaton we will be dealing with. The subsection is an adapted version of the first part of Messerschmidt *et al.* (2006). More (formal) details of the development of restarting automata can be found in Otto (2006).

An *sRL-automaton* (*simple RL-automaton*)  $M$  is (in general) a nondeterministic machine with a finite-state control  $Q$ , a finite characteristic vocabulary  $\Sigma$ , and a head with the ability to scan exactly one symbol (word) that works on a flexible tape delimited by the left sentinel  $\phi$  and the right sentinel  $\$$ .

Let us proceed a bit more formally. A simple *RL-automaton* is a tuple  $M = (Q, \Sigma, \delta, q_0, \phi, \$)$ , where:

- $Q$  is a finite set of states,
- $\Sigma$  is a finite vocabulary (the characteristic vocabulary),
- $\phi, \$$  are sentinels,  $\{\phi, \$\}$  do not belong to  $\Sigma$ ,
- $q_0$  from  $Q$  is the initial state,
- $\delta$  is the transition relation  $\approx$  a finite set of instructions of the shape  $(q, a) \rightarrow_M (p, Op)$ , where  $q, p$  are states from  $Q$ ,  $a$  is a symbol from  $\Sigma$ , and  $Op$  is an operation, where the particular operations correspond to the particular types of steps (move-right, move-left, delete, accept, reject, and restart step).

For an input sentence  $w \in \Sigma^*$ , the initial tape inscription is  $\phi w \$$ . To process this input,  $M$  starts in its initial state  $q_0$  with its window over the left end of the tape, scanning the left sentinel  $\phi$ . According to its transition relation,  $M$  performs *move-right steps* and *move-left steps*, which change the state of  $M$  and shift the window one position to the right or to the left, respectively, and *delete steps*, which delete the content of the window, thus shorten the tape, change the state, and shift the window to the right neighbor of the symbol deleted. Of course, neither the left sentinel  $\phi$  nor the right sentinel  $\$$  may be deleted. At the right end of the tape,  $M$  either halts and *accepts*, or it halts and *rejects*, or it *restarts*, that is, it places its window over the left end of the tape and reenters the initial state. It is required that before the first restart step and also between any two restart steps,  $M$  executes at least one delete operation.

A *configuration* of  $M$  is a string  $\alpha q \beta$  where  $q \in Q$ , and either  $\alpha = \lambda$  and  $\beta \in \{\phi\} \cdot \Sigma^* \cdot \{\$\}$  or  $\alpha \in \{\phi\} \cdot \Sigma^*$  and  $\beta \in \Sigma^* \cdot \{\$\}$ ; here  $q$  represents the current state,  $\alpha \beta$  is the current content of the tape, and it is understood that the window contains the first symbol of  $\beta$ . A configuration of the form  $q_0 \phi w \$$  is called a *restarting configuration*.

We observe that each computation of an *sRL*-automaton  $M$  consists of certain phases. Each part of a computation of  $M$  from a restarting configuration to the next restarting configuration is called a *cycle*. The part after the last restart operation is called the *tail*. We use the notation  $u \vdash_M^c v$  to denote a cycle of  $M$  that begins with the restarting configuration  $q_0 \phi u \$$  and ends with the restarting configuration  $q_0 \phi v \$$ ; the relation  $\vdash_M^{c*}$  is the reflexive and transitive closure of  $\vdash_M^c$ .

An input  $w \in \Sigma^*$  is *accepted* by  $M$ , if there is an accepting computation which starts with the (initial) configuration  $q_0 \phi w \$$ . By  $L_\Sigma(M)$  we denote the *characteristic language* consisting of all strings accepted by  $M$ ; we say that  $M$  *recognizes (accepts) the language*  $L_\Sigma(M)$ . By  $S_\Sigma(M)$  we denote the *simple language* accepted by  $M$ , which consists of all strings that  $M$  accepts by computations without a restart step. By *sRL* we denote the class of all *sRL*-automata.

A *t-sRL-automaton* ( $t \geq 1$ ) is an *sRL*-automaton  $M$  which uses at most  $t$  delete operations in a cycle and any string of  $S_\Sigma(M)$  has no more than  $t$  symbols (wordforms).

**Remark:** The *t-sRL*-automata are two-way automata which allow, in any cycle, to check the whole sentence before reduction (deleting). This reminds us of the behavior of a linguist who can read the whole sentence before choosing the reduction. The automaton should be non-deterministic in general in order to be able to change the order of deleting cycles. That serves for witnessing the independence of some parts of the sentence, see the section about the analysis by

reduction. Another message from this section is that there is a  $t$  which creates a boundary for the number of deletions in a cycle and for the size of the accepted irreducible strings.

Based on Messerschmidt *et al.* (2006), we can describe a  $t$ -sRL-automaton by *metainstructions* of the form

$(\phi \cdot E_0, a_1, E_1, a_2, E_2, \dots, E_{s-1}, a_s, E_s \cdot \$)$ ,  $1 \leq s \leq t$ , where

- $E_0, E_1, \dots, E_s$  are regular languages (often represented by regular expressions), called the *regular constraints* of this instruction, and
- $a_1, a_2, \dots, a_s \in \Sigma$  correspond to letters that are deleted by  $M$  during one cycle.

In order to execute this metainstruction,  $M$  starts from a configuration  $q_0\phi w\$$ ; it will get stuck (and so reject), if  $w$  does not admit a factorization of the form  $w = v_0a_1v_1a_2\dots v_{s-1}a_s v_s$  such that  $v_i \in E_i$  for all  $i = 0, \dots, s$ . On the other hand, if  $w$  admits factorizations of this form, then one of them is chosen nondeterministically, and the restarting configuration  $q_0\phi w\$$  is transformed into  $q_0\phi v_0v_1\dots v_{s-1}v_s\$$ . To describe also the tails of the accepting computations, we use accepting metainstructions of the form  $(\phi \cdot E \cdot \$, \text{Accept})$ , where  $E$  is a regular language (finite in this case). Moreover, we can require that there is only a single accepting metainstruction for  $M$ .

**Example:** Let us illustrate the power of restarting automata on the formal language  $L_{Rt}$ . Let  $t \leq I$ , and let  $L_{Rt} = \{c_0wc_1wc_2\dots c_{t-1}w \mid w \in \{a,b\}^*\}$ . For this language, a  $t$ -sRL-automaton  $M_t$  with a vocabulary  $\Sigma_t = \{c_0, c_1, \dots, c_{t-1}\} \cup \Sigma_0$ , where  $\Sigma_0 = \{a, b\}$ , can be obtained through the following sequence of metainstructions:

- (1)  $(\phi c_0, a, \Sigma_0^* \cdot c_1, a, \Sigma_0^* \cdot c_2, \dots, \Sigma_0^* \cdot c_{t-1}, a, \Sigma_0^* \cdot \$)$ ,
- (2)  $(\phi c_0, b, \Sigma_0^* \cdot c_1, b, \Sigma_0^* \cdot c_2, \dots, \Sigma_0^* \cdot c_{t-1}, b, \Sigma_0^* \cdot \$)$ ,
- (3)  $(\phi c_0 \dots c_{t-1}\$, \text{Accept})$ .

It follows easily that  $L(M_t) = L_{Rt}$  holds.

We emphasize the following property of restarting automata. It plays an important role in our applications of restarting automata.

### Definition (Correctness Preserving Property)

A  $t$ -sRL-automaton  $M$  is (*strongly*) *correctness preserving* if  $u \in L_\Sigma(M)$  and  $u \vdash_M^{c^*} v$  imply that  $v \in L_\Sigma(M)$ .

It is rather obvious that all deterministic  $t$ -sRL-automata are correctness preserving. On the other hand, one can easily construct examples of nondeterministic  $t$ -sRL-automata that are not correctness preserving.

### 3.2. The 4-LRL-automata and related notions

Let us finally introduce the model of automaton proposed for modeling of analysis by reduction for FGD. A *4-LRL-automaton* (*4-level sRL-automaton*)  $M_{FGD}$  is a correctness preserving *t-sRL-automaton*. Its characteristic vocabulary  $\Sigma$  is partitioned into four subvocabularies  $\Sigma_0, \dots, \Sigma_3$ .  $M_{FGD}$  deletes at least one symbol from  $\Sigma_0$  in each cycle.

**Remark:** The correctness preserving property of  $M_{FGD}$  ensures a good simulation of the linguist performing the analysis by reduction. Similarly as the linguist, the automaton  $M_{FGD}$  should not make a mistake during analysis by reduction, otherwise there is something wrong, e.g., the characteristic language is badly proposed. This situation can be fixed by adding some new categories (symbols). The correctness preserving property can be automatically tested. This may be useful for checking and improving a language description in the context of FGD. The request of the deletion of at least one surface wordform in any cycle represents the request of the (generalized) lexicalization of FGD.

Let us inherit the notion  $L_\Sigma(M_{FGD})$ , characteristic language of  $M_{FGD}$ , and  $S_\Sigma(M_{FGD})$ , the simple language, from the previous subsection. All the notions introduced below are derived from these notions.

As the first step, we introduce an (*analysis by*) *reduction system* involved by  $M_{FGD}$ , and by the set of level alphabets  $\Sigma_0, \dots, \Sigma_3$ . It is defined as follows:

$$RS(M_{FGD}) = (\Sigma^*, \vdash_{M_{FGD}}^c, S_\Sigma(M_{FGD}), \Sigma_0, \dots, \Sigma_3).$$

The reduction system (by  $M_{FGD}$ ) formalizes the notion of the analysis by reduction of FGD in an algebraic, non-procedural way. Observe that for each  $w \in \Sigma^*$  we have  $w \in L_\Sigma(M_{FGD})$  if and only if  $w \vdash_{M_{FGD}}^{c*} v$  holds for some string  $v \in S_\Sigma(M_{FGD})$ .

A *language of level  $j$  recognized by  $M_{FGD}$* , where  $0 \leq j \leq 3$ , is the set of all sentences (strings) that are obtained from  $L_\Sigma(M_{FGD})$  by removing all symbols which do not belong to  $\Sigma_j$ . We denote it  $L_j(M_{FGD})$ . Particularly,  $L_0(M_{FGD})$  represents the surface language *LC* defined by  $M_{FGD}$ ; similarly,  $L_3(M_{FGD})$  represents the language of tectogrammatical representations *LM* defined by  $M_{FGD}$  (see Section 1).

Now we can define the *characteristic relation*  $SH(M_{FGD})$  given by  $M_{FGD}$ :

$SH(M_{FGD}) = \{(u,y) \mid u \in L_0(M_{FGD}), y \in L_3(M_{FGD}) \text{ and there is a } w \in L_\Sigma(M_{FGD}) \text{ such that } u \text{ is obtained from } w \text{ by deleting the symbols not belonging to } \Sigma_0, \text{ and } y \text{ is obtained from } w \text{ by deleting the symbols not belonging to } \Sigma_3 \}$ .

**Remark:** The characteristic relation represents the basic relations in language description, relations of synonymy and ambiguity in language  $L$ . In other words, it embraces the translation of the surface language  $LC$  into the tectogrammatical language and vice versa. From this notion, the remaining notions, analysis and synthesis, can be derived.

We introduce the *SH-synthesis* by  $M_{FGD}$  for any  $y \in LM$  as a set of pairs  $(u,y)$  belonging to  $SH(M_{FGD})$ :

$$\textit{synthesis-SH}(M_{FGD},y) = \{(u,y) \mid (u,y) \in SH(M_{FGD})\}$$

The *SH-synthesis* associates a tectogrammatical representation (i.e., string  $y$  from  $LM$ ) with all its possible surface sentences  $u$  belonging to  $LC$ . This notion allows for checking the synonymy and its degree provided by  $M_{FGD}$ . The linguistic issue is to decrease the degree of the synonymy by  $M_{FGD}$  by the gradual refinement of  $M_{FGD}$ .

Finally we introduce the dual notion to the *SH-synthesis*, the *SH-analysis* by  $M_{FGD}$  of  $u \in LC$ :

$$\textit{analysis-SH}(M_{FGD},u) = \{(u,y) \mid (u,y) \in SH(M_{FGD})\}$$

The *SH-analysis* returns, to a given surface sentence  $u$ , all its possible tectogrammatical representations, i.e., it allows for checking the ambiguity of an individual surface sentence. This notion provides the formal definition for the task of full syntactico-semantic analysis by  $M_{FGD}$ .

#### 4. Concluding remarks

The paper presents the basic formal notions that allow for formalizing the notion of analysis by reduction for Functional Generative Description, FGD. We have outlined and exemplified the method of analysis by reduction and its application in processing dependencies and word order in a language with a high degree of free word order. Based on this experience, we have introduced the 4-level reduction system for FGD based on the notion of simple restarting automata. This new formal frame allows us to define formally the characteristic relation for FGD, which renders synonymy and ambiguity in the studied language.

Such a formalization makes it possible to propose a software environment for the further development. It provides a possibility to describe exactly the basic phenomena observed during linguistic research. Further, it allows for studying suitable algorithms for tasks in computational linguistics, namely automatic syntactico-semantic analysis and synthesis.

The presented notions are also useful to show exactly the differences and similarities between the methodological basis of our (computational) linguistic school and the methodological bases of other schools. The basic message given here is to show the possibility of generalizing the principle of lexicalization

through the layers in order to obtain a checking procedure for FGD via analysis by reduction.

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## The Interaction between Stress, Syntax and Meaning in Slovenian Priscianic Formations

### 1. Introduction

Priscianic or parasitic formations are formations in which one member of a paradigm is not formed on the lexical root of the paradigm but instead on the stem of another member of the paradigm (Matthews 1972, Aronoff 1994). The best known case of such formation is the Latin future active participle, which is formed by adding the suffix *-uur-* to the perfect passive participle of a verb. For example, the future active participle of the verb *lauda-re* ('praise'-inf) is *laudaat-uur-*, and is formed on the stem of the perfect passive participle *laudaat-*.

In this paper I discuss one example of Priscianic formation in Slovenian – the nominalizations in which the nominal affix *ec* is attached to either the active *l*-participle, (1a), or the passive *(e)n/t*-participle, (2a).<sup>1</sup> In (1b) and (2b), the participles are given in their verbal environments.

- |     |    |                                     |    |   |
|-----|----|-------------------------------------|----|---|
| (1) | a. | <i>plavalec</i><br>"swimmer"        | b. | <i>Janez je plaval v reki.</i><br>John is swim <sub><i>l</i>-ptc</sub> in river<br>"John swam in the river."                                |
| (2) | a. | <i>ranjenec</i><br>"injured person" | b. | <i>Vojak je bil ranjen včeraj.</i><br>soldier is been injure <sub><i>(e)n/t</i>-ptc</sub> yesterday<br>"The soldier was injured yesterday." |

The nominalizations in question display interesting characteristics in terms of their meaning and stress pattern. If the affix attaches to an *l*-participle, the newly-formed noun carries the meaning *the agent/instrument of the event denoted by the l-participle*, as illustrated in (3).<sup>2</sup>

1 In Slovenian there are several nominalizations that can be considered Priscianic, involving either attachment to the *l*-participle or to the *(e)n/t*-participle. Some examples are given in (i). In this paper I focus only on the nominalizations involving the two participles and the affix *ec*. See Marvin (2002) for a detailed discussion of some other combinations.

(i) a. *drsal-išče* "a skating ring" = skate<sub>*l*-ptc</sub>-EC + affix *išče*

b. *mešan-ost* "the property of being mixed" = mix<sub>*(e)n/t*-ptc</sub>-EC + affix *ost*

2 In order to remain neutral as to the nature of the *ec* suffix, I shall gloss it as EC.

- (3) a. *plaval-ec*  
swim<sub>*l*-ptc-EC</sub>  
"swimmer" (*agent*)
- b. *brisal-ec*  
wipe<sub>*l*-ptc-EC</sub>  
"windshield wiper" (*instrument*)

If the affix attaches to the *(e)n/t*-participle, the meaning is *the carrier of the property denoted by the (e)n/t-participle*, as illustrated in (4).

- (4) a. *utopljen-ec*  
drown<sub>*(e)n/t*-ptc-EC</sub>  
"drowned person" = in the state of being drowned
- b. *umazan-ec*  
dirty<sub>*(e)n/t*-ptc-EC</sub>  
"dirty person" = in the state of being dirty

Comparing the two nominalizations with the participles they are related to in terms of the stress pattern, we observe the following, table (1): In *l*-participle nominalizations stress always falls on the pre-suffix syllable, regardless of its position in the *l*-participle (the leftmost two columns), while in *(e)n/t*-participle nominalizations stress is in the same position as it is in the *(e)n/t*-participle (the rightmost two columns).

Table (1) Stress properties of *ec*-nominalizations<sup>3</sup>

<i>l</i> -ptc.	<i>ec</i> -nom.	<i>(e)n/t</i> -ptc.	<i>ec</i> -nom.
<b>plával</b> 'swim'	<b>plaválec</b> *plávalec	<b>pítan</b> 'feed'	<b>pítanec</b> *pitánec
<b>moríl</b> 'murder'	<b>morílec</b>	<b>obdarován</b> 'reward'	<b>obdarovánec</b>
<b>cépil</b> 'vaccinate'	<b>cepílec</b> *cépilec	<b>cépljen</b> 'vaccinate'	<b>cépljenec</b> *cepljénc
<b>sprehájal</b> 'take a walk'	<b>sprehájalec</b> , *sprehájalec	<b>sprehájan</b> 'take a walk'	<b>sprehájanec</b> *sprehájánec

3 The ungrammatical examples in *l*-participle nominalizations are given to show that the grammatical version is the only possible one, that is, the stress has to shift to the pre-suffix syllable unless it is already there in the participle, as in the pair *moríl* - *morílec*. In the *(e)n/t*-participle nominalizations, the ungrammatical examples are given to show that there is no possibility of a stress shift to the pre-suffix syllable, however, the stress can accidentally appear on that syllable if it is there already in the participle, as in the pair *obdarován* - *obdarovánec*. Some further examples of both nominalizations with their stress patterns are provided in the Appendix.

Given that the same suffix appears in both types of nominalizations, how can the differences in meaning and stress be accounted for? The main objective of this paper is to show that the contrasts in the data above can be derived from the syntactic structures of the two nominalizations, which relate the semantics and stress properties of their constituent parts, and from the computation of stress in relation to the syntactic structures in question. Participial nominalizations contain as part of their structure the structure of the respective participles themselves. Given that the suffix *ec* is a constant, and the participle component a variable, the contrast between examples in which the suffix attaches to the *l*-participle and those in which it attaches to the *(e)n/t*-participle should thus not come as a surprise. As to how the structure and stress interact in the nominalizations, I shall claim that the stress pattern of such nominalizations argues for the presence of phases and phase spell-out at category-forming phrases, as first suggested in Marantz (2001).

## 2. Slovenian Participles in Verbal Environments

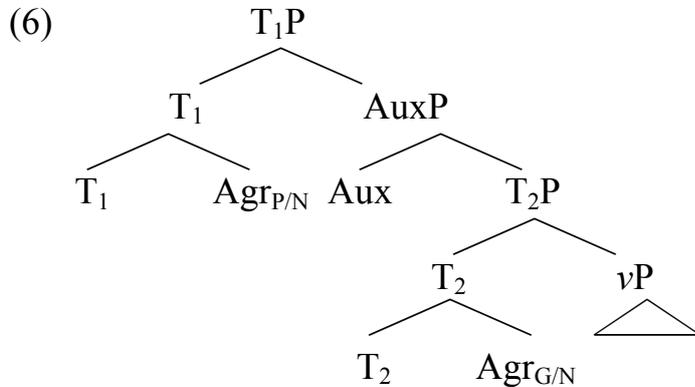
This section is devoted to describing verbal environments in which both participles in question appear and stating the frameworks in which their morpho-syntactic and morpho-semantic properties will be expressed in this paper.

### 2.1. Temporal Relations and the *l*-participle

The *l*-participle is an active participle that appears in Slovenian compound tenses (auxiliary 'be' + *l*-participle) and conditional sentences (non-agreeing conditional particle 'bi' + *l*-participle). The finite auxiliary 'be' agrees with the subject in number and person, while the participle (of the main verb or the auxiliary) agrees with the subject in number and gender. Some examples are given in (5).

- (5) a. *bom*            *delala*  
be-fut/1sg    work<sub>*l*-ptc</sub>-sg/fem  
"I will be working" (Future)
- b. *bi*                *delala*  
would         work<sub>*l*-ptc</sub>-fem/sg  
"I would be working" (Present Conditional)

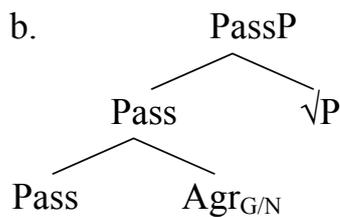
The ‘basic tree’ of a compound tense looks as in (6), where  $T_1$  is associated with person/number agreement ( $\text{Agr}_{P/N}$ ) and  $T_2$ , the participial head, with gender/number agreement ( $\text{Agr}_{G/N}$ ).<sup>4</sup>



## 2.2. The (e)n/t-participle

The (e)n/t-participle appears in the formation of the passive voice, showing an allomorphy between the vocabulary items /n/, /en/ and /t/ and is either adjectival or verbal. Here, an analysis is adopted in which adjectival passives involve an attachment of the passive morpheme to the root, with no verbalizing head  $v$ , (7). Verbal passives, on the other hand, involve attaching the passive morpheme above a  $vP$ , (8).<sup>5</sup>

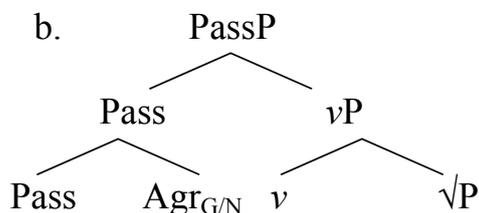
- (7) a. *Vaza je bila razbita.*  
 Vase be-pres/3sg be<sub>l-ptc</sub>-sg/fem break<sub>(e)n/t-ptc</sub>-sg/fem  
 "The vase was broken." (= in the state of being broken)



4 As to temporal properties of the *l*-participle, this paper operates under Giorgi and Pianesi's (1997) implementation of Reichenbach's (1947) theory of tenses, based on entities S (utterance time), E (event time) and R (reference time), and the binary relations between them. Giorgi and Pianesi propose that certain combinations of such temporal relations are incorporated in two syntactic heads, the tense heads  $T_1$  and  $T_2$ ,  $T_1$  lexicalizing the tense relation S/R and  $T_2$  lexicalizing the relation E/R. Although the investigation into temporal properties is relevant for the meaning of the nominalizations in question, it goes beyond the scope of this paper.

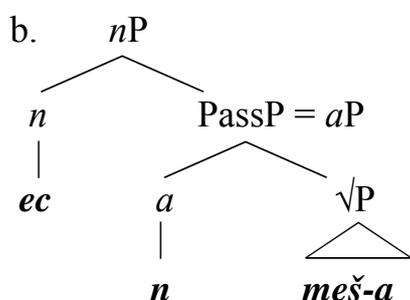
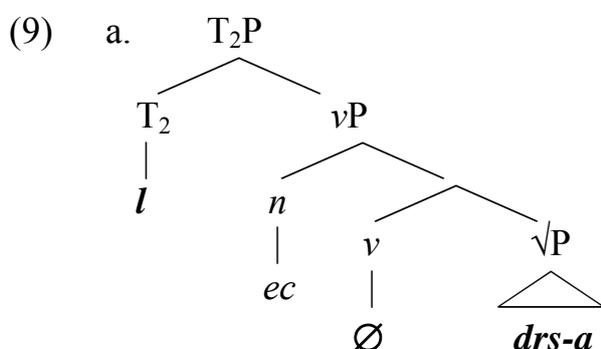
5 See Embick (2004), Marantz (2001), Kratzer (forthcoming) for a detailed account and arguments for such an analysis.

- (8) a. *Vaza je bila razbita od Janeza.*  
 Vase is be<sub>*l*-ptc-sg/fem</sub> break<sub>*(e)n/t*-ptc-sg/fem</sub> by John  
 "The vase was broken by John." (= John broke the vase.)



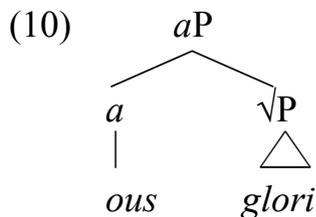
### 3. The Structure of Slovenian Priscianic Nominalizations

In this part of the paper it will be argued that Slovenian *ec*-nominalizations exemplified in (1) and (2) have the structures as in (9). The *ec* nominalization involving the *l*-participle, which I shall hereafter refer to as *external argument nominalization*, has a structure in which the affix *ec* is inserted in an external argument position, Spec vP, while the participial morphology is inserted in the T<sub>2</sub> position, (9a). The *ec*-nominalization involving the *(e)n/t*-participle, which I shall hereafter refer to as *adjectival passive nominalization*, has a structure in which the participial morphology is inserted into an adjectival *Pass* node, while the affix is added in the next step of the derivation, (9b).<sup>6</sup>



6 The mechanism deriving the surface realizations of the two different structures will be discussed in the remainder of Section 3 and in Section 4.

The analysis in this study relies on the specific framework of word structure proposed in Marantz (1997, 2001), in which the author proposes a way of unifying the inflectional and derivational morphology by allowing the syntactic component to perform all merger operations, including those between morphemes within a word. Marantz (1997) also proposes a different way of treating roots and syntactic categories as found in previous approaches to word formation, where syntactic categories such as V, N, A are properties of roots (stems) and affixes. In Marantz's theory roots and affixes have no category per se, but are merged in the syntax with category-forming functional heads such as the 'little' *n*, *v*, *a* to form nouns, verbs and adjectives, respectively. These heads are typically realized by overt or phonologically zero derivational affixes, i.e. the affixes determining the category of the word. For example, the adjective *glorious* has the syntactic structure as in (10).



In this work I adopt Marantz's (1997) view as well as a version of it found in Alexiadou (2001), where word-forming affixes are inserted into little functional heads, while the heads that finally determine the category are functional projections specific to nouns, verbs and adjectives. For example, nominal affixes such as *ec* are inserted into functional nodes, but the nominal character of the word is provided by Number, a higher functional head appearing in nouns.

In the remainder of this section, the arguments for the proposed structures will be presented. In the section to follow it will be shown how the difference in the stress pattern of the two nominalizations follows from the structure: In the external argument nominalization the affix is inserted within the first little functional phrase (*vP*), which is the first word level phase, while in the adjectival passive nominalization it is inserted outside the first little functional phrase (outside *aP*), that is at the second word level phase.

### 3.1 External Argument Nominalization

The external argument nominalization is a very productive type of nominalization in which the affix *ec* attaches to the *l*-participle of a given verb (with some restrictions, see below). In this paper I rely on the extensive collection of data found in Stramljič-Breznik (1999) and Bajec et al.'s (1994) *Dictionary of Standard Slovenian*.

Up to now only examples of nominalizations where the affix is the masculine singular *ec* have been provided.<sup>7</sup> However, such nominalizations are possible also with the feminine and the neuter variant, which then appear in their singular, plural and dual variants in all six cases.<sup>8</sup> In this paper, the masculine singular nominative *ec* will be used as the representative case.

- (11) MASCULINE: *dvigalec* "lifter", *morilec* "murderer"  
FEMININE: *dvigalka* "lifter" or "lifting device", *morilka* "murderer"  
NEUTER: *dvigalo* "lift", *rezalo* "cutting device"

These nominalizations have an entirely predictable meaning: Referring to the "external argument" of the event denoted by the root, they can either have the meaning of "agent" or "instrument".<sup>9</sup> I propose that the predictability of the "external argument" meaning follows from the structure in which the affix is inserted, i.e. in the external argument position, the specifier of the head *v* in the structure (9a).

This proposal has an immediate prediction: unergative and transitive verbs have an external argument position, while unaccusative verbs do not.

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7 To be more specific, the vowel in *ec* is a yer that surfaces as /e/ only in the nominative singular, when followed by another yer. However, I shall keep referring to it as *ec* for the sake of simplicity.

8 The nominalizers are specified for gender (*ec* for masculine, *k* for feminine,  $\emptyset$  for neuter), and are as all nouns followed by a case/number ending. So, in *plaval-ec*, 'swimmer', *ec* is the nominalizing affix, followed by the zero case/number ending, in *plaval-ka*, 'swimmer-fem' *k* is the affix, while *a* is the singular/nominative ending. In *rezal-o*, 'cutting device', the nominalizing affix is  $\emptyset$ , while *o* is the singular/nominative ending. The meaning is to some extent connected with the gender. Neuter nominalizations usually, though not necessarily, have the meaning of "instrument", while the meaning of "agent" is expressed by masculine and feminine nominalizations, though it is not the only meaning these two nominalizations are associated with.

9 The external argument nominalizations with the "experiencer" meaning are very rarely found in the language. One of the reviewers pointed out the following possibilities in (i).

- (i) *doživljalec* "experiencer"  
*občudovalec* "admirer"

I attribute the rare occurrence of experiencer nominalizations to the fact that the verbs of the "subject experiencer" – "object experiencer" pairs require the reflexive clitic *SE* when the subject is an experiencer. Below I give examples of *be angry* and *frighten* with subject experiencer in (i) and an object experiencer in (ii).

- (ii) *Janez se je prestrašil/jezil.*

John-nom Refl is frightened/was angry  
"John was frightened", "John was angry"

- (iii) *Janeza je prestrašila nevihta/ Janeza je razjezila nevihta.*

John-acc is frightened storm-nom/John-acc is angered storm-nom  
"The storm frightened/angered John."

Therefore we expect the former to be able to form external argument nominalizations, while the latter should be incapable of doing so. This prediction indeed holds; while it is possible to use *l*-participles of unaccusative verbs as parts of VPs in sentences, as seen in (12), no external argument nominalizations are available with unaccusative verbs, as seen from (13).

- (12) a. *Janez je pešal zaradi bolezni.*  
 Janez be-aux weaken<sub>*l*-ptc</sub> due-to illness  
 "Janez was weakening due to his illness."  
 b. *Pacient je umiral en mesec.*  
 patient be-aux die<sub>*l*-ptc</sub> one month  
 "The patient was dying for a month."

- (13) \**umiralec* "dier"; \**pešalec* "person that is weakening"; \**hodilec* "walker"

Further examples in support of the above proposal are the deadjectival inchoative-causative pairs of verbs differing in the theme vowel (*i* for the causative, *e* for the inchoative). The inchoative verb does not project an external argument, while the causative one does. As exemplified below, external argument nominalizations are possible only with the causative variant in (15), which confirms our prediction.

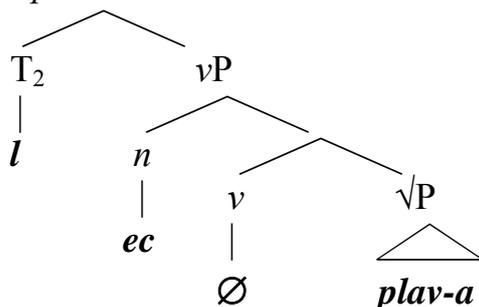
- (14) Inchoative: \**črnelec* "the one that becomes black"  
 (15) Causative: *črnilec* "the one that blackens"

If the proposal is that the affix occupies an external argument position, then the pattern observed in (14) and (15) follows naturally.

### 3.1.1. Linearization of External Argument Nominalizations

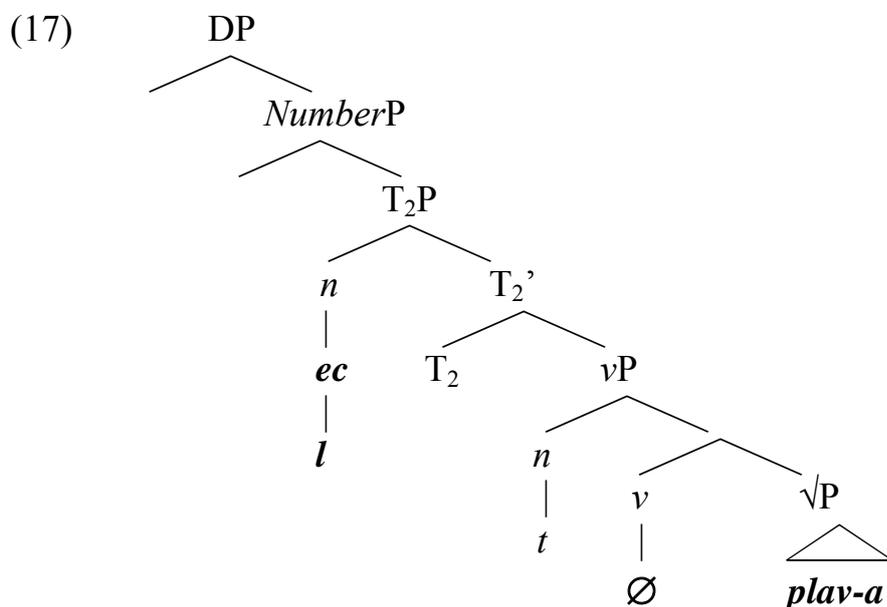
In the previous section it was proposed that in external argument nominalizations, the affix realizing a little *n* head starts out in the specifier of *v*P position, as in (9a), repeated here in (16).

- (16) *plavalec* "swimmer"



This structure, however, does not result in the correct order of the constituents. After the movement of the root to *v*, to *n* and then to  $T_2$ , the nominalization surfaces as \**plavaecl*, while what we would like to get for 'a swimmer' is *plavalec*.

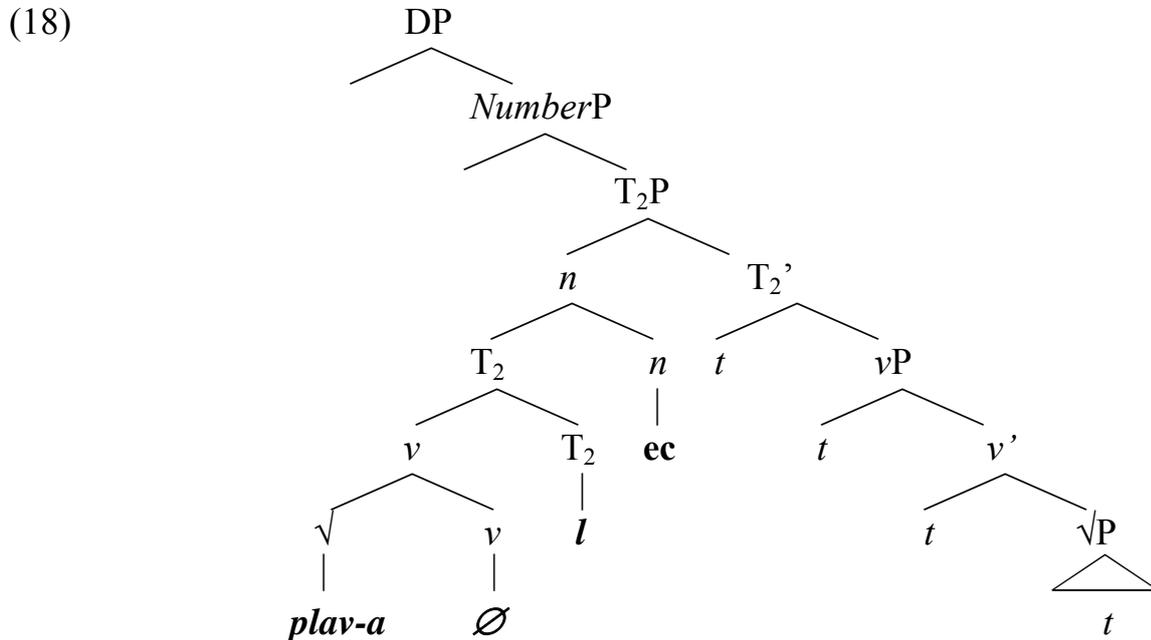
This problem is solved by movement of the nominalizing head to the specifier position of  $T_2$  for purposes of feature checking. The temporal head  $T_2$ , being a Tense head, hosts an EPP feature, which triggers the movement of *n* to the Spec of  $T_2$  in a fashion similar to how a T head triggers the movement of the subject DP to satisfy its EPP feature at the sentence level. As to the agreement relations,  $T_2$  and *n* agree in gender; as already noted, there are three vocabulary items that can be inserted into the *n* node, differing in gender: the masculine *ec*, the feminine *k* and the neuter  $\emptyset$ . The first movement is exemplified in (17).<sup>10</sup>



The structure in (17) is then subject to verb movement – the verb root adjoins to little *v* and then they move together to  $T_2$  to 'pick up' the *tense* morphology, and

10 This analysis assumes the possibility of a head appearing in the specifier position, which violates the standard syntactic principles. At this point I can offer no principled account of the syntax in which such appearance and the subsequent movement are acceptable – an account of the sort goes beyond the scope of the paper. However, it is not so unthinkable to imagine that the syntax component could allow for such appearance at the level of word – after all, it is not the case that this possibility changes the syntactic principles per se, it is just that the elements that are merged and moved at the level of word differ from the elements that are merged and moved at the level of the sentence. The operations *Move* and *Merge* remain the same at both levels with some restrictions such as, for example, on the type of the element that can be merged and moved in order to avoid heads being merged in the specifier position at the sentence level.

finally to *n* to satisfy a morphological property of the *n* head. These movements together give us the correct linear order of morphemes: *plava-l-ec* 'a swimmer', as in (18).



In (17) and (18) the full structure of the nominalization appearing as a DP in a sentence is given; as a DP, it contains the *Determiner* and the *Number* heads. The *Determiner* head is the head proposed by Abney (1987), following the idea that noun phrases, like clauses, are headed by a functional element. *NumberP*, in the head of which an inflectional affix carrying number and case agreement is inserted, was proposed by various authors from studies suggesting that the structure of noun phrases includes additional inflectional structure between DP and *nP* (see e.g. Ritter 1991, Cinque 1993, Alexiadou 2001). Alexiadou (2001) proposes that *Number* is also responsible for nominalizing unspecified roots. I adopt the existence of DP and *NumberP* and, crucially, *Number* as a nominalizer; thus, the resulting structure in (18) is a noun.

A few words on the headedness of the structure in (18) are in order here. The traditional intuition is that external argument nominalizations refer to the external argument and should thus be headed by the *n*-head that refers to the external argument. The structure in (18) does not capture this intuition simply because such intuition is not relevant in the proposed structure. That is, considering a detailed structure of external argument nominalization, what is crucial is not the fact that the traditional 'external argument morpheme' is the head of the nominalization, but the fact that this 'morpheme' is inserted in the external argument position (Spec, *vP*) in the syntactic structure of the word. The intuition that this paper is trying to capture is that external argument

nominalization is in itself a sentence, in which the external argument realized by the suffix *-ec* is an agent or an instrument of the event denoted by the verb phrase present in such nominalizations. The external argument nominalization thus basically has the structure of a sentence, with the movement of external argument *n* into the specifier of a Tense phrase (T<sub>2</sub>P). If the Tense phrase were immediately dominated by T<sub>1</sub>P and CP, the linguistic object constructed would be a sentence (as in (1b), for instance); since it is immediately dominated by *NumberP* (and DP), the linguistic object constructed is a noun, (as in (1a) and (18)).

More on the linearization process and the importance of movement for phonological spell-out is presented in Section 4.

### 3.2. Adjectival Passive Nominalization

In this section I discuss the *ec*-nominalization with the adjectival *(e)n/t*-participle, whose meaning is *the carrier of the property denoted by the participle* and for which the proposed structure is as in (9b).

There are two arguments that I would like to put forward for saying that the adjectival passive nominalization has the proposed structure. First, it can be shown that such nominalization is not a verbal passive, i.e. it does not involve a little *v* functional head, and second, it can be shown that the status of the participles involved in these nominalizations is adjectival.

The argument against a verbal passive analysis has to do with adverbial modification of the event component in the nominalization. If there were a *vP* in the structure of the nominalization, then the event modification should be possible, (Harley 1995). However, the data suggests that in such nominalizations there is no event component and thus no *vP*. Adjectival passive nominalizations cannot be modified by an adverbial so that the adverbial refers to the event of the nominal, as shown in (19). In (19a), *ranjenec* 'injured person' can not be understood as 'injured person who gets injured every day'. In a similar fashion, in (19b) *utopljenec* 'drowned person' is a drowned person in the lake, but not necessarily a person who drowned in the lake – the person could well have drowned in a river and was then found in the lake.

- (19) a. \**ranjenec*            *vsak dan*  
           injure<sub>(e)n/t-ptc-EC</sub>    every day  
           \*"an injured person who gets injured every day"
- b. *utopljenec*            *v jezeru*  
           drown<sub>(e)n/t-ptc-EC</sub>    in lake  
           "a drowned person who is in the lake"; \*"a drowned person who  
           drowned in the lake"

The next step is to show that participles in adjectival passive nominalizations are indeed adjectival. An argument for this claim is the distribution that these participles share with other adjectives appearing in the same type of *ec*-nominalization – non-derived (20a, 20b) and derived (20c, 20d).

- (20) a. *bel* "white" → *belec* "white person"  
 b. *zelen* "inexperienced" → *zelenec* "inexperienced person"  
 c. *brad-at* "bearded" → *bradatec* "bearded person"  
 d. *domišlj-av* "conceited" → *domišljavec* "conceited person"

Finally, let us consider the thematic structure of adjectival passive nominalization. Given that we showed that it does not contain a *vP*, we expect its meaning not to be associated with any particular semantic role pertaining to the *vP* domain, e.g. agent, patient, theme. This prediction indeed holds. Adjectival passive nominalizations do not have a predictable meaning in terms of semantic roles, as is found with external argument nominalizations. In many cases, the meaning of the nominalization is indeed associated with a patient or a theme, (21a, 21b), but that does not hold of all cases, as seen in (21c, 21d).<sup>11</sup>

- (21) a. *utopljenec* "person who drowned or was drowned"  
 b. *pretepenec* "beaten person"  
 c. *slavljenec* "person celebrating" or "person celebrated"  
 d. *dosluzenec* "person that finished serving"

#### 4. Stress and Phases in Slovenian *ec*-nominalizations

In this part it will be shown how stress properties of Slovenian *ec*-nominalizations constitute evidence for the syntactic structures argued for in the previous section and in addition argue for the phase-by-phase spell-out of word level syntax, as stated in (22).

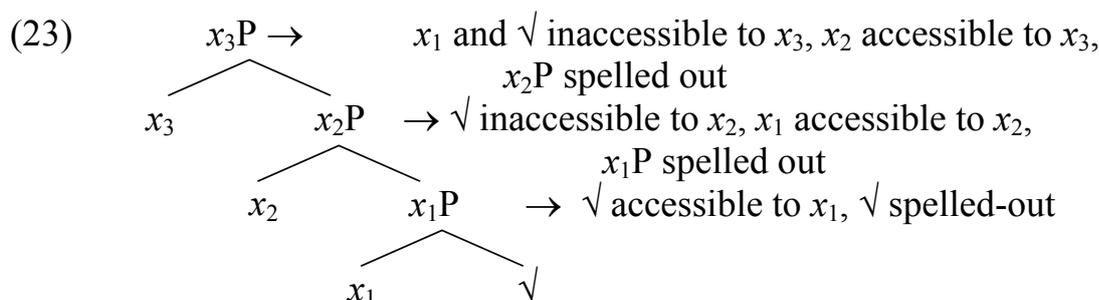
- (22) Phases at the word level:  
 a. Phrases headed by word-forming functional heads, such as little *v*, little *n* and little *a*, constitute spell-out domains at the word level, Marantz (2001).  
 b. Phases at the word level are subject to Chomsky's (2001) Phase Impenetrability Condition.  
 c. *Phase Impenetrability Condition at the word level*: H and its edge (specifiers, adjoined elements) are spelled out at the next strong

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<sup>11</sup> A similar point is found in Barker (1998) and Marantz (2001) about the difference between *er*- and *ee*-nominalizations in English.

phase. The domain of H is spelled out at the phase of HP. A head *h* adjoined to H is in the domain of H.

The idea is schematized in (23). At the point of the functional head *x* attachment (where *x* stands for *v*, *n*, or *a*), the complement of the 'little' *x* is spelled out and from that point on inaccessible to heads attaching higher.<sup>12</sup>



Let me, at this point, clarify how the phase-by-phase spell-out process relates to the process of vocabulary insertion. In distributed morphology, the model this paper operates in, the syntax component manipulates bundles of syntactico-semantic features as terminal nodes, which are later supplied phonological material via vocabulary insertion in the process of spell-out. Joining the notions of vocabulary insertion and phase-by-phase spell-out, it is assumed here that vocabulary insertion occurs at each phase. However, vocabulary insertion of a vocabulary item in a phase does not mean that this item is also spelled-out in the phase it is inserted in. Thus, at a given phase, the specifier and the head of the phase are the locus of vocabulary insertion, but are, crucially, not spelled-out in that phase. The only constituent that is spelled-out in that phase is the complement of the head.

The analysis of stress in participial nominalizations will center around the differences in stress between external argument nominalizations and adjectival passive nominalizations. It will be shown that the stress facts are not only a result of stress properties of nominal affixes but also of the structures in which these affixes are inserted.

#### 4.1. Background Assumptions: Theory of Stress

The analysis of the data is proposed within the framework of Idsardi (1992), Halle and Idsardi (1995) and Halle (1997b). Slovenian belongs to the group of languages in which words contain exactly one stressed vowel and in which the

12 This proposal treats all *v*Ps, including *v*Ps of unaccusative verbs, as phases, which is not entirely consistent with Chomsky (2001), where only transitive *v*Ps are considered phases. See Legate (2003) for a view similar to the one taken in this paper.

position of stress cannot be predicted on the basis of the phonological properties of the word or from syllable counting. It is common for such languages to show stress alternation within a particular paradigm. For example, one group of nouns has a property of stress variation according to case. Below I give an example from Slovenian noun *mož*, where we find initial stress in Nom., Dat., Loc., and Instr., but final in Gen. and Acc., all singular.

- (24) Nom: *móž* "man" Gen: *možá* Dat: *móžu*  
 Acc: *možá* Loc: *móžu* Inst: *móžem*

Halle (1997b) proposes the rules in (25) for stress assignment in IE languages with movable stress, such as Slovenian.

- (25) Stress and accent in Indo-European, Halle (1997b):
- a. Morphemes have idiosyncratic accents, which are marked in vocabulary representations with a left parenthesis on line 0. They can be accented: (\*; unaccented: \*; or post-accenting: \*(.
  - b. Line 0 is subject to the edge-marking rule RRR (insert a right bracket to the right of the rightmost asterisk).
  - c. Line 0 is subject to head-marking rule L (the leftmost asterisk is the head).
  - d. Line 1 is subject to edge marking rule LLL (insert a left bracket to the left of the leftmost asterisk).
  - e. Line 1 is subject to the head-marking rule L.
  - f. Assign high tone to the head of the word, low tone to all other line 0 elements.

The examples in (26) are from the paradigm in (24): a derivation of an unaccented root *mož-* followed by an unaccented case ending *-u* (Dat. sg.), (26a), and by an accented case ending *-a* (Acc. sg.), (26b).

- (26) a.  $\begin{array}{l} \textit{mož} + \textit{u} \\ | \quad | \\ * \quad *) \\ (* \\ * \end{array}$  line 0, RRR, head L  
 line 1, LLL, head L  
 line 2  
**móžu**



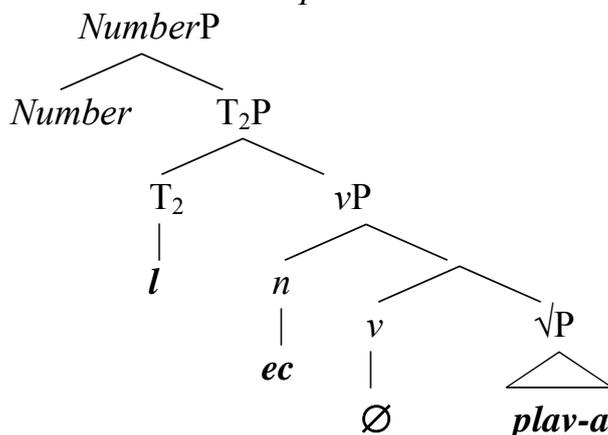
When attaching to the *(e)n/t*-participle, *ec* appears to be recessive; the stress is found in the same position as in the *(e)n/t*-participle without the affix.

How do we account for the fact that an affix appears to be dominant and recessive at the same time? The proposal in this paper is that the vocabulary item *ec* is specified for stress properties as in (27), while the stress of *ec* nominalizations follows from both the stress properties of the affix and the differences in the syntactic structures of participial nominalizations. On this view, *ec* is always a dominant affix; however, the activation of its stress-changing properties depends on its attachment position in the word structure.

Specifically, the proposal is that the stress data argue for the notion of phase in word formation as given at the beginning of this section. The affix *ec* can affect the stress placement of a particular chunk of word if attached before the point in the derivation when that chunk is sent to PF, in other words, within the phase *xP* of that chunk. So, if *ec* is attached within an *xP*, where *x* is a category-forming functional head, it will influence the stress of the *xP* complement. If attached outside *xP*, it will have no bearing on the stress of the *xP* complement, since at that point the phonological form of the latter will have already been negotiated.

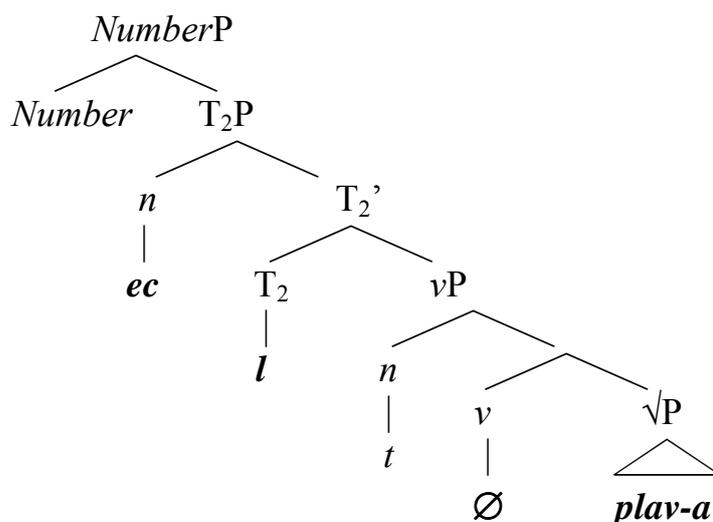
Let us now see how stress and structure interact first in external argument nominalizations and then in adjectival passive nominalizations. In external argument nominalizations, the nominalizing affix which realizes a little *n* head starts out in the specifier of the little *v* as its external argument.

(28) Before movement: *plavalec* "swimmer"



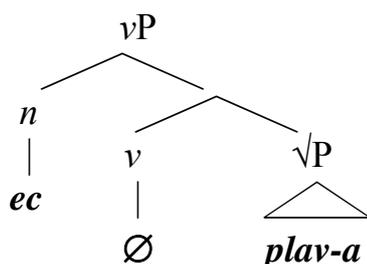
An *Agree* relation in terms of gender is established between  $T_2$  and the affix *ec*. To satisfy the EPP feature on  $T_2$ , *ec* moves to the Spec of  $T_2$ . After the movement takes place, the structure we get is as in (29).

(29) After movement



Let us now consider the stages of the phase spell-out of this word. The first phase occurs at  $vP$ , where the structure is (30). It is assumed that vocabulary insertion occurs at each phase.<sup>14</sup>

(30)

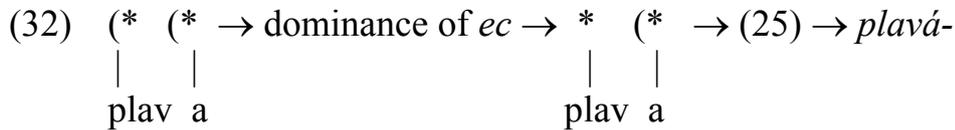


At  $vP$  the complement of  $v$ , the root phrase, is spelled out. That means that its stress properties will be negotiated at  $vP$  and that the head  $v$  and its edge ( $n$  here) will be able to influence the spell-out. We know independently that the root *plav* 'swim' and the theme vowel *a* are both accented from the lexicon – they carry a left bracket to the left of their only syllable. And we know that *ec* is dominant, (25). Taking into account not only the surface form of the nominalizations but also the syntactic structure in (30), the dominance of *ec* can be restated as (31).

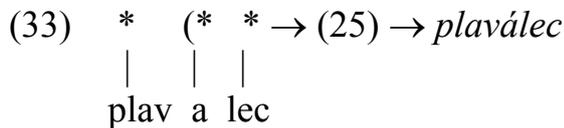
- (31) *ec*:
1. wipes out the stress on the constituent it c-commands,
  2. places stress on the rightmost syllable of that constituent.

14 This means that the elements that move out of the phase are not only abstract nodes, but vocabulary items. A parallel can be seen in the movement of the external argument realized by a DP – a DP inserted in the external argument position has been subject to vocabulary insertion before its movement to TP.

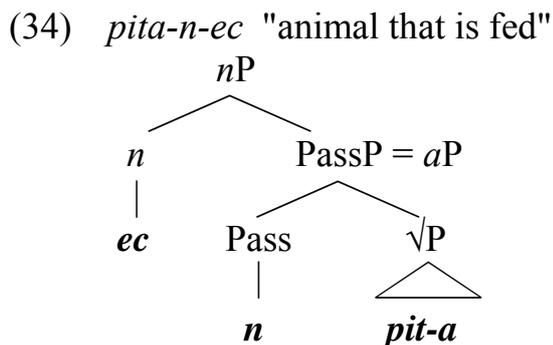
That means *ec* will wipe out the stress on  $\sqrt{P}$ , the constituent it attaches to and which it c-commands, and insert a bracket which will ensure that the rightmost syllable of that constituent receives stress. The stress assignment in the spelled-out complement will proceed as in (32).



The next spell-out occurs at the next category-forming head, the nominalizing head *Number*, at which point *n* (realized by *ec*) has already moved from the Spec of  $vP$  to the Spec of  $T_2P$ . At *NumberP*,  $T_2P$  is spelled out as *plaválec*, as indicated in (33).



In adjectival passive nominalizations, on the other hand, the affix *ec* does not influence the stress of the root phrase. This behavior follows from the syntactic structure of the nominalization and the place of the *ec* attachment. When attached to the (*e*)*n*/*t*-participle, the nominal affix *ec* does not start within the first category-forming phrase (i.e. the *aP* phase), but is rather attached in the next higher phase, the *nP* phase, as in (34).



According to the phase analysis at the word level, the spell-out of the root phrase will take place at *aP*. We know independently that the root *pit* 'feed' and the theme vowel *a* are both accented from the lexicon – they carry a left bracket to the left of their only syllable. The stress spell-out of  $\sqrt{P}$  at the *aP* phase is illustrated in (35).

$$(35) \quad \begin{array}{c} (* \quad (* \rightarrow (25) \rightarrow \textit{pita-} \\ | \quad | \\ \textit{pit} \quad \textit{a} \end{array}$$

By the time the affix is attached and spelled out, the pronunciation of the root will already have been determined and the affix, attached outside the *aP* phase, will have no bearing on its stress. Thus it will appear as if the affix is recessive and not dominant, as illustrated in (36).

$$(36) \quad \begin{array}{c} (* \quad (* \quad * \rightarrow (25) \rightarrow \textit{pitanec} \\ | \quad | \quad | \\ \textit{pit} \quad \textit{a} \quad \textit{nec} \end{array}$$

## 5. Conclusion

This paper presented an analysis of Slovenian nominalizations involving attachment of the nominal affix to either the *l*-participle or the (*e*)*n/t*-participle. Limiting the scope to the most common case, in which the affix *ec* attaches to these two participle forms, it was proposed that the differences in the meaning and stress pattern of the nominalizations result from a difference in the structure of the participles involved and the place of affix insertion. For cases in which *ec* attaches to the *l*-participle, it was argued that the predictability of the meaning "external argument" follows from the fact that the affix is inserted in the external argument position, in Spec, *vP*. For cases in which *ec* attaches to the (*e*)*n/t*-participle the paper argued for an attachment to an adjectival PassP.

In Section 4 I discussed the stress pattern differences between the two nominalizations, proposing that they stem from the interaction of stress and structure: the spell-out of words proceeds in phases defined by category-forming heads with the cyclic spell-out. Given that in the *l*-participle nominalizations the affix *ec* is inserted in a position within the first phase, it forces the stress to appear on the rightmost syllable of the constituent it c-commands, that is, the *Root* Phrase. As a result, while *l*-participles can have stress on any syllable, in the nominalizations sharing the *l*-participial structure stress always appears on the rightmost syllable of the *Root* Phrase, which is, in the surface form, the syllable preceding *ec*. In (*e*)*n/t*-participle nominalizations, on the other hand, the affix *ec* is inserted outside the first phase and therefore has no bearing on the spell-out of the complement, that is the *Root* Phrase. As a consequence, stress appears in the same position in the (*e*)*n/t*-participle and in the nominalization sharing the (*e*)*n/t*-participial structure.

The analysis of data from Slovenian indicates that the syntactic structure in word formation, specifically, the existence of phases at the word level, is

necessary to make generalizations about the meaning and stress properties of words in Slovenian. Consequently, this result gives support to a theory of morphology that treats word formation as occurring in the syntax component, following the same syntactic constraints as apply at the sentence level.

## Appendix<sup>15</sup>

### *External argument nominalization*

<b>boríl</b>	fight <sub>/-ptc</sub>	<b>borílec</b>	"fighter", "fencer"
<b>brál</b>	read <sub>/-ptc</sub>	<b>brálec</b>	"reader"
<b>brúsíl</b>	sharpen <sub>/-ptc</sub>	<b>brusílec</b>	"sharpener" (person or instrument)
<b>častíl</b>	worship <sub>/-ptc</sub>	<b>častílec</b>	"worshipper"
<b>darovál</b>	donate <sub>/-ptc</sub>	<b>daroválec</b>	"donor"
<b>dopisovál</b>	correspond <sub>/-ptc</sub>	<b>dopisoválec</b>	"correspondent"
<b>gasíl</b>	extinguish <sub>/-ptc</sub>	<b>gasílec</b>	"fire-fighter"
<b>glédal</b>	watch <sub>/-ptc</sub>	<b>gledálec</b>	"watcher"
<b>igrál</b>	act <sub>/-ptc</sub> play <sub>/-ptc</sub>	<b>igrálec</b>	"player", "actor"
<b>ískal</b>	search <sub>/-ptc</sub>	<b>iskálec</b>	"searcher", "search engine"
<b>izdájál</b>	betray <sub>/-ptc</sub>	<b>izdajálec</b>	"betrayor"
<b>izsiljevál</b>	blackmail <sub>/-ptc</sub>	<b>izsiljeválec</b>	"blackmailer"
<b>kadíl</b>	smoke <sub>/-ptc</sub>	<b>kadílec</b>	"smoker"
<b>kópal</b>	bathe <sub>/-ptc</sub>	<b>kopálec</b>	"bather"
<b>krotíl</b>	tame <sub>/-ptc</sub>	<b>krotílec</b>	"tamer"
<b>nósil</b>	carry <sub>/-ptc</sub>	<b>nosílec</b>	"carrier" (person or instrument)
<b>snážil</b>	clean <sub>/-ptc</sub>	<b>snážilec</b>	"cleaner"
<b>stóril</b>	commit <sub>/-ptc</sub>	<b>storílec</b>	"person committing something"

### *Adjectival passive nominalization* (table continues on next page)

<b>aretíran</b>	arrest <sub>(e)n/t-ptc</sub>	<b>aretíranec</b>	"arrested person"
<b>izčrpan</b>	exhaust <sub>(e)n/t-ptc</sub>	<b>izčrpanec</b>	"exhausted person"
<b>izgnán</b>	exile <sub>(e)n/t-ptc</sub>	<b>izgnánec</b>	"person in exile"
<b>izprašán</b>	question <sub>(e)n/t-ptc</sub>	<b>izprašanec</b>	"questioned person"
<b>izstrádan</b>	starve <sub>(e)n/t-ptc</sub>	<b>izstrádanec</b>	"starved person"
<b>izséljen</b>	move out <sub>(e)n/t-ptc</sub>	<b>izséljenec</b>	"emigrant"
<b>izžréban</b>	raffle <sub>(e)n/t-ptc</sub>	<b>izžrébanec</b>	"winner in a raffle"

15 A list of 18 common external argument and adjectival passive nominalizations (together with their corresponding participles and their stress patterns and meanings) is added to the paper as suggested by a reviewer. Due to the lack of space, this is not an exhaustive list either in terms of the number of nominalizations as well as in terms of the number of forms found with one participle – only the masculine forms are listed.

<b>kován</b>	forge <sub>(e)n/t-ptc</sub>	<b>kovánek</b>	"coin"
<b>krížan</b>	crossbreed <sub>(e)n/t-ptc</sub>	<b>krížanec</b>	"crossbreed"
<b>ljúbljen</b>	love <sub>(e)n/t-ptc</sub>	<b>ljúbljenec</b>	"favourite"
<b>navelíčan</b>	be bored <sub>(e)n/t-ptc</sub>	<b>navelíčanec</b>	"bored person"
<b>obubóžan</b>	become poor <sub>(e)n/t-ptc</sub>	<b>obubóžanec</b>	"impoverished person"
<b>obúpan</b>	despair <sub>(e)n/t-ptc</sub>	<b>obúpanec</b>	"desperado"
<b>osúmljen</b>	suspect <sub>(e)n/t-ptc</sub>	<b>osúmljenec</b>	"suspect"
<b>pláčan</b>	pay <sub>(e)n/t-ptc</sub>	<b>pláčanec</b>	"person hired for money"
<b>rézan</b>	cut <sub>(e)n/t-ptc</sub>	<b>rézanec</b>	"noodle"
<b>zbégan</b>	confuse <sub>(e)n/t-ptc</sub>	<b>zbéganec</b>	"confused person"
<b>zadávljen</b>	strangle <sub>(e)n/t-ptc</sub>	<b>zadávljenec</b>	"strangled person"

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## **A Case Study of Predication\***

### **1. Introduction**

In this paper, I discuss the predictions that the current Case Theory (Chomsky 2000 and later work) makes for cross-linguistic patterns of predicate case (to be discussed below) and demonstrate that, even adjusted, it cannot deal with the full range of facts. I propose a new Case Theory, based on the hypothesis that Case features are assigned by a head to its complement (cf. Stowell 1981),<sup>1</sup> with the ensuing consequences that (a) a particular Case feature can be assigned to more than one terminal, and (b) more than one Case feature can be assigned to a particular terminal. I will couple this new theory of syntactic Case with certain standard Distributed Morphology assumptions about featural decomposition of morphological case. I will argue that not only does this new Case Theory allow us to account for predicate Case assignment but also that it opens a new direction of research into multiple Case assignment elsewhere.

The current Case Theory consists of two parts: Case Filter, which is the condition determining what must be assigned Case, and conditions on Case assignment, which describe under what circumstances case is assigned. Both have changed during the development of the P&P framework, but for reasons of space, I will only address here the most recent formulation, where the need to be Case-marked is a property of xNPs<sup>2</sup> and Case-marking obtains in tandem with agreement (i.e., in the course of  $\phi$ -feature valuation). Left outside the scope of this Case Theory are such issues as Case assignment by heads outside the verbal

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\* **Acknowledgments:** Many thanks to Morris Halle and Hilda Koopman for the discussion, to Eddy Ruys for many suggestions and comments, and to an anonymous FDSL reviewer for helping me to clarify the paper by offering a number of alternative hypotheses. I am also very grateful to Liina Pylkkänen and Elsi Kaiser for the discussion of Finnish and to Gabriella Tóth for the detailed discussion of Hungarian (which unfortunately didn't make it into this paper).

**List of case abbreviations:** ACC accusative, CIT citation, DAT dative, ESS essive, GEN genitive, INSTR instrumental, NOM nominative, PART partitive, TRS translative.

- 1 The use of "Case assignment", as opposed to "Case valuation" or "Case checking", is not crucial for the theory. However, as there is no theoretical upper limit on the number of Case features assigned to a particular terminal and all terminals receive Case features, the checking approach appears to be notably less elegant in that it requires what essentially amounts to a look-ahead.
- 2 I use the abbreviations xAP (extended AP) and xNP (extended NP) in order to indicate that it is irrelevant for the discussion at hand which functional layers are projected.

and phrasal domain, inherent and lexical Case, and Case assignment to xNPs other than arguments – in particular to predicates.

An independent question is that of what Case is. Pesetsky and Torrego (2001, 2004, in print) propose that Case is the uninterpretable counterpart of the interpretable tense features on xNPs. Unfortunately, as a result tense becomes a somewhat abstract notion – a problem that is partially remedied by the view advanced by Bailyn (2004), where Cases spell out uninterpretable functional category features (T is spelled out as nominative, Asp as accusative, Q as genitive, etc.). My proposal fits in with these reductionist views, but takes an even more radical position: for me Case is the expression of the featural makeup of a head (lexical or functional) on (some terms of) its complement. A Case feature is thus always uninterpretable and more than one Case feature can be assigned to a given term. The morphological case marking on a term reflects this combination of Case features.

The paper is structured as follows: I will first present the broad cross-linguistic picture of the various patterns of predicate Case assignment. For each pattern, I will argue that the treatment reserved for it in the current Case Theory is inadequate and show how my alternative theory accounts for them. For reasons of space, I will only touch upon the issues of parameterization of Case assignment and barriers to Case percolation, though I will provide some independent motivation for my Case Theory by showing how it easily explains multiple case assignment in Russian cardinal-containing xNPs.

## 2. The big picture

At least the following patterns of Case-marking on xNP and xAP predicates are observed:<sup>3</sup>

- Lack of case, expressed as default, nominative or zero case, as in (1), from Harar Oromo (Owens 1985 via Comrie 1997)<sup>4</sup>
- Case-agreement (the predicate is marked with the same case as the subject), as in (2)
- Dedicated predicative case(s), as in (3) and (4)
- A combination of the above, as in Georgian (not to be discussed)

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3 PP predicates are never case-marked; xNP and xAP predicates may be marked differently, as is the case in Serbo-Croatian (see Bailyn 2001) and Hungarian.

4 The citation case (bare form) in Harar Oromo is also used for direct objects; nominative case is morphologically marked. Due to insufficient data I will not discuss this pattern here.

- (1) *hommish-nii barána gáarii.* Harar Oromo: lack of case  
 harvest<sub>NOM</sub> this.year good<sub>CIT</sub>  
 The harvest is good this year.
- (2) a. *Ciceronem clarum habent.* Latin: Case-agreement  
 Cicero<sub>ACC</sub> famous<sub>ACC</sub> consider/hold  
 “They consider Cicero famous.”  
 b. *Cicero clarus habetur.*  
 Cicero<sub>NOM</sub> famous<sub>NOM</sub> consider/hold<sub>PASS</sub>  
 “Cicero is considered famous.”
- (3) a. *Ja sčitaju ee lingvistkoj.* Russian: predicative case  
 I consider her<sub>ACC</sub> linguist<sub>INSTR</sub>  
 “I consider her a linguist.”  
 b. *Ona vernulas’ krasavicej.*  
 she came back beauty<sub>INSTR</sub>  
 “She came back a beauty.”
- (4) a. *Toini on sairaa-na.* Finnish: multiple predicative cases  
 Toini<sub>NOM</sub> be<sub>3SG</sub> ill<sub>ESS</sub>  
 “Toini is ill.”  
 b. *Toini tul-i sairaa-ksi.*  
 Toini<sub>NOM</sub> become<sub>PAST.3SG</sub> ill<sub>TRS</sub>  
 “Toini became ill.”

As the standard Case Theory is mostly concerned with argument xNPs, it has little to say about Case on predicates. The original formulation of the Case Filter (Chomsky 1981, Vergnaud 1982) only rules out xNPs that are overt and have no Case, and therefore does not account for case-marked xAP predicates (unless they are explicitly added to the Case Filter). Once the Case Filter was restated as a Visibility Condition on arguments (Case is required to render an xNP visible for theta-role assignment, see Chomsky 1986, 1993 and Chomsky and Lasnik 1993), case-marked xAP predicates become much more difficult to deal with because they are not theta-marked. Finally, in the most recent minimalist framework (Chomsky 2000 and later work): Case is an unvalued and uninterpretable Case feature, which is valued in the course of  $\phi$ -feature valuation of a higher head (the probe). Importantly, agreement and Case are tightly linked in this approach because what makes an xNP visible for agreement is unvalued Case features. As a result, xAP predicates become even more of a problem: they do not trigger agreement on their own (in fact, the opposite). While this issue can be fixed by somewhat extending the notion of agreement (Chomsky 2001), problems with locality and  $\phi$ -features (see below) make this framework the least able to deal with predicate Case (unless it is assumed to be non-structural and left out of discussion altogether).

I believe that the main problem lies in the link established between Case and agreement. In what follows, I will detail the problems with predicate Case in the probe-goal framework and explain how they can be resolved in the theory where Case is treated as a relation between a head and its complement.

### 3. Case agreement

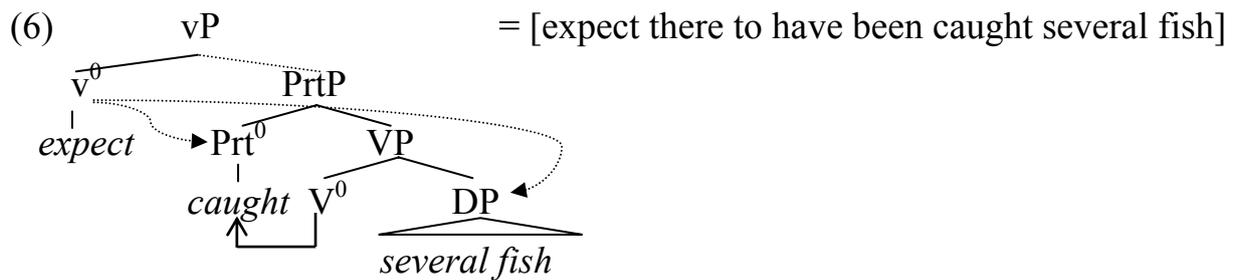
In a number of languages, such as Latin, Icelandic, Modern Greek, Albanian, and Serbo-Croatian, the predicate shows the same case as the subject:

- (5) a. *Hún er kennari/\*kennara.* Maling and Sprouse (1995): Icelandic  
 he is teacher<sub>NOM/ACC</sub>  
 “He is a teacher.”
- b. *Ég taldi hana/\*hun vera kennara/\*kennari.*  
 I believed her<sub>ACC/NOM</sub> to-be teacher<sub>ACC/NOM</sub>  
 “I believe her to be a teacher.”

The standard view on Case-agreement (also known as Case-matching or concord) is that it results from the syntactic agreement relation established between the subject and the predicate, where surface case is just one of the features that the subject and the predicate agree in. An alternative view of Case-agreement, proposed by Bailyn (2001) and Chomsky (2001), contends that no formal agreement relation is established between the subject and the predicate for Case-agreement to occur. Instead the two targets get the same Case separately as a result of independent  $\phi$ -valuation. I will first discuss the problems arising from multiple  $\phi$ -feature valuation, and then show how my proposal deals with Case agreement.

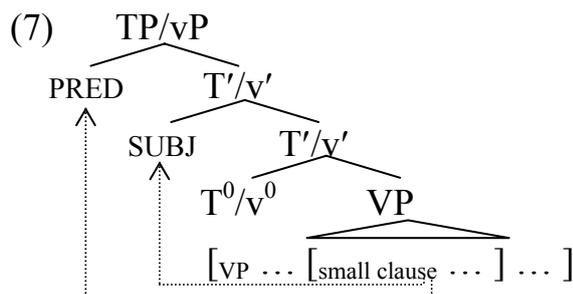
#### 3.1. Case-argument as multiple feature-checking

Chomsky (2001) proposes that Case-agreement is a side-effect of sequential multiple feature-valuation. The structure in (6) schematizes Case-agreement with the participle in the Icelandic expletive construction: when the matrix  $v^0$  (or  $T^0$ ) is merged, it first probes  $\text{Prt}^0$  (which has by then agreed with the object DP and thus had its  $\phi$ -features valued) and values the Case features on  $\text{Prt}^0$  (on the assumption that two bundles of uninterpretable  $\phi$ -features can be checked against each other). Then, since  $\text{Prt}^0$  (containing no person features) is not  $\phi$ -complete,  $v^0$  probes again and values the Case of the object DP.



This precise algorithm cannot be extended to small clauses,<sup>5</sup> because the subject is higher than the predicate and being  $\phi$ -complete, would not allow further probing. The issue can be circumvented, if the goal of feature valuation is the entire small clause (PredP; PrtP in (6)) rather than just the predicate.<sup>6</sup>

In the reformulation of Bailyn and Citko (1999) proposed by Bailyn (2001), Case-agreement is also a side-effect of multiple feature-valuation, but unlike in Chomsky’s proposal, the valuation is simultaneous. As a result, the issue of the relative positions of the subject and the predicate does not arise.



However, for this proposal to work it is necessary to assume that the cross-linguistic default is feature checking with multiple goals (rather than a single goal). In addition, as noted by Pereltsvaig (2001a), we need to explain why such multiple feature checking is only possible for the verb *be*.

- (8) \**Ivan poceloval student.*  
 Ivan<sub>NOM</sub> kissed student<sub>NOM</sub>  
 intended: ‘Ivan kissed a/the student.’

5 Frampton et al. (2000) identify the same problem for *there*-less variant of (6).

6 An additional potential problem comes from the fact that an xNP predicate also has a set of interpretable  $\phi$ -features. This problem can be avoided if  $\phi$ -feature bundle of a predicate xNP is incomplete, which is consistent with the deficient number-marking on some predicates in some languages. Further problems with xNP predicates are discussed below.

Neither of the two proposals can account for Case-agreement in control infinitives. As noted by Cecchetto and Oniga (2004) in this context (see also Baltin 1995), a depictive secondary predicate inside a control infinitive in Latin is marked with the same case as the controller, as in (9). Cecchetto and Oniga (2004) attribute the case-marking on the depictive to Case-agreement with the PRO subject (see also Landau 2006, 2007) – but how does the PRO subject get its Case?

- (9) a. *Ego iubeo te esse bonum.* Cecchetto and Oniga (2004)  
 I order you<sub>ACC</sub> be<sub>INF</sub> good<sub>ACC</sub>  
 “I order you to be good.”  
 b. *Quieto tibi licet esse.*  
 quiet<sub>DAT</sub> you<sub>DAT</sub> licit-is be<sub>INF</sub>  
 “You are allowed to stay quiet.”

Likewise, a major problem for the link between Case and agreement is caused by the  $\phi$ -features of an xNP predicate: (at least some of) such features are interpretable and need not be the same as the  $\phi$ -features of the subject:

- (10) *Ego nolo Caesar esse.* Cecchetto and Oniga (2004)  
 I<sub>NOM</sub> not-want Caesar<sub>NOM</sub> to-be  
 “I don’t want to be Caesar.”

The minimalist view of Case as an artifact of  $\phi$ -feature valuation is not easily compatible with there being more than one set of interpretable features to agree with. One way of handling this problem is the proposal by Frampton and Gutmann (2000), where agreement is treated as “feature coalescence”: features that have agreed, whether valued or not, become the same entity and no multiple feature-valuation is then necessary. Yet even in this framework, the question of Case agreement between two xNPs remains unresolved.

### 3.2. Case agreement as concord

As demonstrated below, the problem with using multiple feature valuation as a mechanism for deriving Case agreement is the necessity of dealing with more than one set of interpretable  $\phi$ -features and in small clause environments only. To avoid this problem, as well as some others to be detailed below, I propose that Case-agreement is an artifact of Case assignment to the constituent that contains both “agreeing” items. My proposal thus also fits in with the trend of

excluding syntactic agreement (the Agree relation) from Case agreement,<sup>7</sup> and its formulation strongly resembles the proposal by Stowell (1981):

**(11) Case Theory, Mark II**

Case features are assigned by a head to its complement

As a result, nominative is assigned by  $T^0$  to its sister (vP, AspP, ModP...) and accusative is assigned by  $v^0$  to VP. Any terminal (that can bear morphological case) is Case-marked by each Case-assigning head that c-commands it unless Case percolation is blocked by an intervening head.<sup>8</sup> This straightforwardly accounts for Case-agreement on the assumption that in languages with Case-agreement the head of the small clause  $Pred^0$  does not assign Case: since it is the entire small clause that receives Case from the relevant c-commanding head (accusative if  $v^0$  can assign it, nominative if  $v^0$  is defective), the subject and the predicate are marked with the same case.

The proposal in (11) offers a principled view of Case as a redundancy-increasing method of marking the derivational history of a tree on its leaves on the assumption that Case features are the uninterpretable counterparts of the features composing a given (functional) head.<sup>9</sup> The major consequence of this theory is that a single terminal may receive more than one Case-feature. I will address the question of how such a bundle of Case-features is spelled out after comparing the theory in (11) to the standard Case Theory.

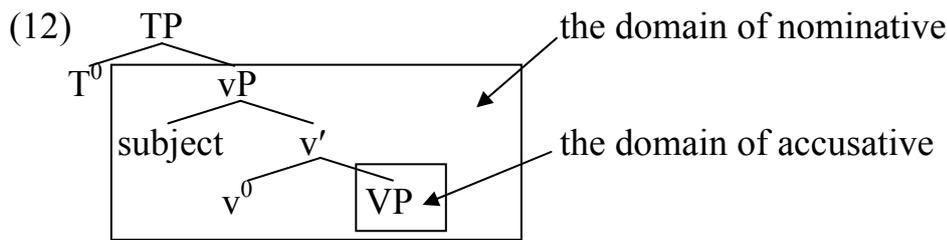
### 3.3. Comparison with the standard Case Theory

Due to the relative positions of  $T^0$  and  $v^0$ , the predictions of the new Case Theory with respect to structural Case assignment are nearly the same as those of the standard Case Theory:

7 The theory is presented here in a nutshell, and does not touch upon such important issues as inherent Case (but see Koopman 2006, Svenonius to appear for arguments that Icelandic “inherent” Case reflects a dependency on a functional projection in the extended verbal phrase and therefore is structural), or default Case assignment (as in the Oromo Harar example (1)).

8 I leave aside here the question of what heads block Case-percolation to their complements (work in progress). For my purposes here it is enough to assume that non-verbal lexical heads block Case percolation to their complements.

9 Due to the lack of space I cannot discuss this assumption in depth here; see Pesetsky and Torrego (2001), (2004), in print and Bailyn (2004) for similar proposals, albeit couched in the terms of the standard Case Theory and employing one feature per functional head.



If a Case-assigning  $v^0$  is present, nominative cannot be assigned below it. Or rather, while it may be assigned, the resulting bundle of Case-features will always be more complex than just the nominative and can be reasonably assumed to correspond to accusative,<sup>10</sup> which would derive the dependence of accusative on the presence of the nominative. If  $v^0$  assigns no Case (as with passives or raising verbs), the object receives nominative.

The Case Filter plays no role in this theory: since any xNP is merged in the domain of some head, it necessarily receives some Case (which may give us a handle on the phenomenon of default Case). As a result, I reject the Null Case or no case approach to PRO; instead, I suggest that control infinitives are merged in the same Case domain as their controllers and therefore receive the same Case (for alternative theories of PRO-licensing see Sigurðsson 1991, Hornstein 1999, Landau 2003, among others).

Finally, on the issue of expletive choice (which in the standard Case Theory is derived from the hypothesis that *there* requires an NP associate because it is not Case-marked, while *it* is only compatible with CP associates because it is), I have little to say. On the assumption that  $T^0$  must value its  $\varphi$ -features and that both the expletive and the associate trigger agreement, *it* cannot combine with an xNP ( $\varphi$ -feature conflict). It could be hypothesized that the combination of *there* with a CP associate would not provide  $T^0$  with a full set of  $\varphi$ -features, as long as we assume (following Koster 1978) that a CP by itself cannot be a subject. A deeper study of the issue would be desirable.

Additional advantages derived from viewing Case as being assigned to a complement include a straightforward analysis of multiple assignment of the same morphological case (e.g., in Korean or Japanese, see also Maling 1989) and obliteration of the need for functional heads in order to account for Case-assignment by non-verbal lexical heads or by prepositions.

I therefore contend that the new Case Theory accounts for the same facts as the old one in addition to being able to deal with predicate Case.

10 The predicted difference in morphological complexity is confirmed by the cross-linguistic frequency of the use of the (featurally simpler) nominative case as default.

### 3.4. Summary

I proposed a new Case Theory based on the assumption that Case features are assigned by a head to its complement. A natural extension of this hypothesis is that Case features are just the uninterpretable counterparts of the interpretable features composing a given head. As a result, not only can predicate Case be easily dealt with, but several other issues receive an immediate explanation.

Though it seems that Case agreement can be partially accounted for the standard Case Theory if multiple feature-valuation and Case-assignment to the entire small clause are permitted (or if Frampton and Gutmann's approach to agreement is adopted), I will now show that the standard Case Theory cannot deal with languages where more than one Case can be assigned to a predicate.

### 4. Russian: the Case of the copula

Languages with a dedicated case appearing on predicates would seem to be the easiest to treat in the standard Case Theory on the assumption that a head can assign (or value) Case to its complement (which is somewhat controversial in the standard minimalism). However, I have so far been unable to find an "ideal" predicate Case language, where a particular case would appear on any predicate in any position. In this section I will discuss one of the simpler patterns of predicate Case marking found in Russian and in Classical Arabic. Finnish, with its more complex pattern of predicate Case marking, is discussed in section 5. Hungarian and Georgian, which involve even more complicated predicate Case patterns, will not be discussed here due to lack of space.

In a nutshell, Russian predicates are marked with the instrumental case, except in the present tense copular sentences, where no overt *be* is present and the predicate must be nominative.<sup>11,12</sup> The same pattern obtains in Arabic: while the default predicate case is accusative, nominative is the only option in the present tense copular sentences (Maling and Sprouse 1995, fn.4). This pattern, where the small clause predicate is marked with the default predicate case in the presence of an overt verb and with nominative otherwise, cannot be dealt with by the standard Case Theory.

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11 I leave aside the question of whether Russian long-form adjectives in the predicate position are xAPs or xNPs (see Babby 1973, 1975, Bailyn 1994, Siegel 1976, Pereltsvaig 2001a, 2001b, among others) as irrelevant here.

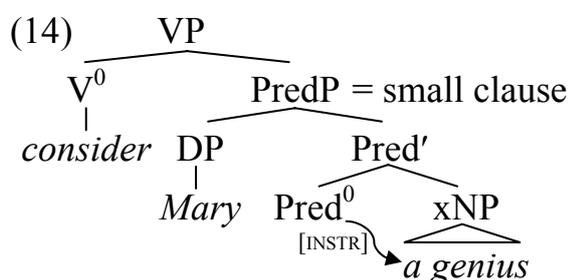
12 It is standardly assumed that Russian depictives appear with both Case-agreement and Case-assignment, depending on their semantics (Filip 2001 and Richardson 2001). However, Pereltsvaig (2001a) provides evidence that "Case-agreeing" depictives are actually extraposed reduced relatives, as I will assume here.

#### 4.1. The head of the small clause

With an overt *be*, the post-copular xNP can be marked with either nominative or instrumental, as shown in (13).<sup>13</sup> However, only instrumental corresponds to true predication; nominative indicates an identity copula (Rothstein 1986, Bailyn and Rubin 1991, Bailyn and Citko 1999, Pereltsvaig 2001a, etc.).

- (13) a. *Puškin byl velikij poët.* identity  
 Pushkin was great poet<sub>NOM</sub>  
 b. *Puškin byl velikim poëtom.* predication  
 Pushkin was great poet<sub>INSTR</sub>  
 “Pushkin was a great poet.”

The standard view, starting with Bowers (1993), is that small clauses are headed by a functional head that makes it possible in some way or another for a predication relation to be established (which is why it is generally called Pred<sup>0</sup>). The majority of the arguments in favor of Pred<sup>0</sup> (see Bowers 1993, Sportiche 1995, Starke 1995, Svenonius 1996, Baker 2003, den Dikken 2006, among many others), come from the syntax of the small clause.<sup>14</sup>



Bailyn and Rubin (1991), Bailyn and Citko (1999) and Bailyn (2001, 2002) propose that Pred<sup>0</sup> assigns the instrumental case to its complement, and

- 13 It must be noted that for post-copular xNPs instrumental is preferred (Wierzbicka 1980, Geist 1998, 1999, Matushansky 2000, Madariaga in progress, etc.). For post-copular xAPs, on the other hand, nominative seems the preferred option (Madariaga in progress).
- 14 One such argument (Aarts 1992, Bowers 1993, Bailyn 2001, 2002, den Dikken 2006, etc.) comes from the elements marked with bold in (i):
- (i) a. They regarded the proposal **as** foolish.  
 b. The little girl was treated **like** a VIP.  
 c. Abby was promoted **to** chairman.  
 d. Claire took Diana **for** an idiot.

The argument is based on the assumption that the small clauses in (i) have overt heads, while in others, the same functional head is covert. I will discuss this assumption in section 5.2.

thus incorrectly predict that small clauses without instrumental case-marking on the predicate should be impossible.

#### 4.2. Predication without instrumental

In the present tense in Russian the copula is null and instrumental marking is impossible. Since with any overt verb including the copula the predicate must be marked instrumental, the question arises why instrumental is disallowed (15b) and nominative is forced (15a) with the covert copula (or in the absence of the copula).<sup>15</sup>

- (15) a. *Vera assistant.*  
       Vera assistant<sub>NOM</sub>  
       “Vera is an assistant.”  
       b. \**Vera assistantom.*  
       Vera assistant<sub>INSTR</sub>

One possible but implausible theory is that the predication structure is not available in the present tense, and what we see in (15a) is an identity *be*, which requires nominative, as in (13a). Besides the obvious complication of the mechanism needed to exclude predication in the present tense, the theory is not supported empirically: once the identity reading of the copular sentence is excluded pragmatically, it can be demonstrated to have a predicative reading in the present tense:

- (16)a. Context: And how did they earn their living?  
*Iisus byl plotnik\*(om), a Magomet byl \*kupec/✓kupcom.*  
 Jesus was carpenter<sub>NOM/INSTR</sub> and Mohammed was merchant<sub>NOM/INSTR</sub>  
 “Jesus was a carpenter and Mohammed was a merchant.”
- b. Context: And how do they earn their living?  
*Magdalena prostitutka, a Iisus plotnik.*  
 Magdalen prostitute and Jesus carpenter  
 “Magdalen is a prostitute and Jesus is a carpenter.”

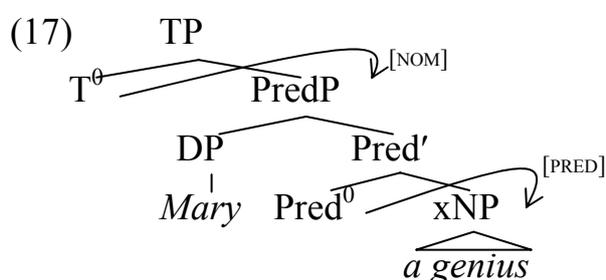
Since a predicative reading is available in (16b), PredP must be present even in absence of an overt copula, where instrumental may not be assigned. I

15 Instrumental is marginally possible without an overt verb if the xNP predicate is interpreted as a temporary capacity and a locative is present, as well as on the few NP predicates with the meaning of ‘cause, reason’ and in a particular tautological construction (Nichols 1981, Bailyn and Rubin 1991). These are probably irrelevant.

conclude that  $\text{Pred}^0$  cannot be the assigner of instrumental,<sup>16</sup> and the question arises as to how instrumental is assigned.

### 4.3. The syntax/morphology interface in Case assignment

If the Case Theory in (11) is correct, then  $\text{Pred}^0$  can assign *some* Case feature to its sister. For the sake of simplicity the Case feature assigned by  $\text{Pred}^0$  will be referred to as [predicative]. Assuming that in the absence of an overt copula the small clause merges as the complement of T (see Bailyn and Rubin 1991, among others, for Russian), we obtain (17) as the underlying structure of (15a) and (16b). Note that the small clause subject is in the domain of T only, while the small clause predicate is in the domain of both  $T^0$  and  $\text{Pred}^0$ .

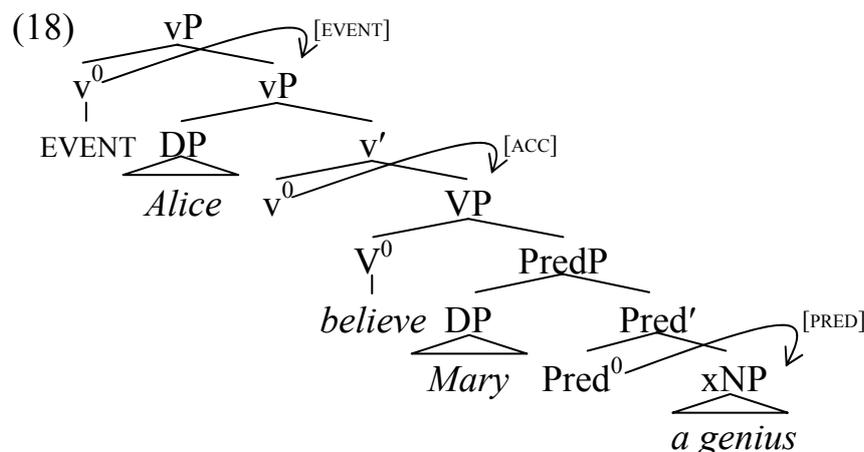


As a result, in the present tense copular sentence the predicate receives two Case features: [nominative] (from  $T^0$ ) and [predicative] (from  $\text{Pred}^0$ ). In a clause containing a verb, the Case-featural bundle becomes more complex, since verbal heads can introduce Case features. The head that I am concerned with here is the one introducing the eventuality argument of the verb, on the assumption that it is projected above the  $vP$  introducing the subject.<sup>17</sup> The Case feature introduced by this  $v^0$  (or perhaps  $\text{Asp}^0$ ) will be dubbed [eventive].

16 An alternative view (Bailyn 2001, 2002) is that more than one  $\text{Pred}^0$  is available, one that assigns instrumental and the other one that doesn't. In absence of independent evidence for the distinction (see also section 5.2), such an analysis amounts to a stipulation.

17 For semantic reasons, subject-oriented depictives, as in (i), have to merge higher than  $v^0$ . Since they still receive the instrumental case, this means that  $v^0$  cannot assign instrumental. I will not discuss independent motivation for the structure in (18) here due to lack of space.

(i) *Liza vernulas' krasavicej.*  
 Liza returned beauty<sub>INSTR</sub>  
 "Liza returned a beauty."



How does a complex Case-feature bundle receive a morphological realization? To answer this question I rely on the following (fairly standard) morphological assumptions:

**(19) The Morphology of Case**

- a. The underlying morphological case is a combination of (privative) features rather than a single feature.
- b. The PF realization of a given bundle of Case features (the surface case) is resolved by language-specific vocabulary insertion rules, whose key properties are impoverishment and underspecification.

Decomposition of morphological case has been independently proposed by Jakobson (1936/1971), Neidle (1982), Halle (1994), Halle and Vaux (1997), etc., and is considerably more compatible with the new Case Theory in (11) than with the standard Case Theory.<sup>18</sup> The notions of impoverishment and underspecification in (19b), on the other hand, are specific to the Distributed Morphology approach (Halle and Marantz 1993, 1994) and permit us to account for the fact that not all features assigned to a given terminal affect its surface representation. As a result, once Case is viewed as complex not only morphologically but also syntactically, the predicate case pattern in Russian can be resolved by the following vocabulary insertion rules:<sup>19</sup>

18 Maling and Sprouse (1995) also suggest that (19a) applies in syntax, but the details of their proposal are completely different. The hypothesis that Case corresponds to an uninterpretable counterpart of a functional feature is also found in Pesetsky and Torrego (2001, 2004), in print and Bailyn (2004).

19 Two points should be made clear here: (1) underspecification in vocabulary insertion rules for Case is independently required for dealing with syncretism; (2) the labels ACC,

(20) **Vocabulary insertion rules (a fragment):**

[predicative, eventive] → INSTR

[nominative] → NOM

[accusative] → ACC

To restate the obvious, the [predicative] Case feature can result in the instrumental case-marking only in the scope of a verb; otherwise it surfaces as nominative (in the present tense copular sentences). Conversely, the [eventive] Case feature has a morpho-syntactic effect only on predicates. An immediate advantage of this analysis is that underspecification can also be used for an alternative treatment of languages with Case agreement if in these languages the relevant case features ([predicative] and [eventive]) are not mentioned in vocabulary insertion rules (i.e., the rules are underspecified for it). In addition, since the identity *be* has no eventuality argument, it cannot assign the Case feature [eventive] to its complement, be it a small clause or a DP, which correctly derives the double nominative in identity sentences, such as (13a).

**5. Finnish: the Case of change-of-state**

As discussed by Fong (2003), Finnish has semantically determined predicate Case-marking: in resultative small clauses and in small-clause complements of change-of-state verbs (*become, remain, make*, and naming/nomination verbs) the translative case is used instead of the default essive.<sup>20</sup> (In order to simplify the exposition, I disregard the fact that the identity *be* assigns nominative, just like in Russian, since the predicative *be* uniformly assigns essive.)

- (21) a. *Toini on sairaa-na.* Finnish  
 Toini<sub>NOM</sub> be<sub>3SG</sub> ill<sub>ESS</sub>  
 “Toini is ill.”
- b. *Me maalas-i-mme seinä-n keltaise-ksi.*  
 we paint<sub>PAST-1PL</sub> wall<sub>ACC</sub> yellow<sub>TRS</sub>  
 “We painted a/the wall yellow.”

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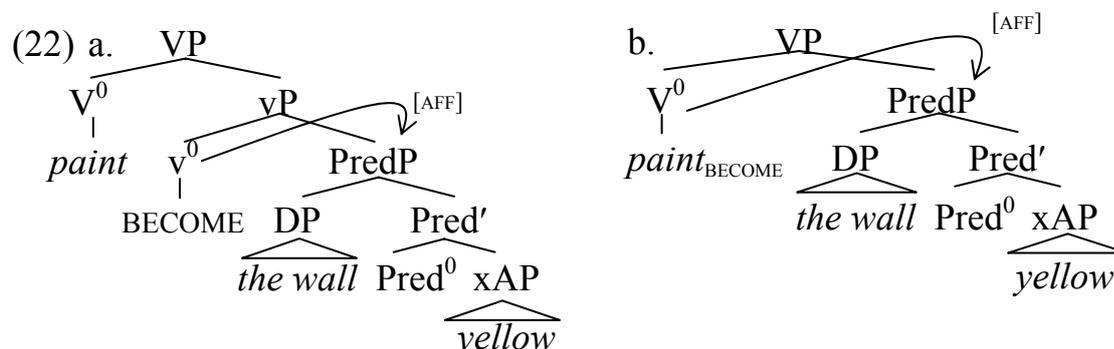
NOM, etc., should be taken as referring to the actual lexical entries – since vocabulary insertion rules for those are considerably more complex due to the interaction with gender and number, and also subject to impoverishment, I use simplified representations here.

- 20 In Hungarian, predicate case marking is considerably more complicated than in Finnish and varies not only with the argument status of the small clause (depictives vs. others), but also under the influence of such factors as intensionality, change-of-state semantics and the lexical category of the predicate, to say nothing of quirky predicate case assignment (Gabriella Tóth, p.c.). I leave Hungarian aside here due to lack of space for an adequate discussion.

Under the standard Case Theory, the sources of the two cases must be in the small clause. Two structures can be envisaged: (1) change-of-state small clauses are headed by a  $\text{Pred}^0$  whose semantics invokes a change-of-state (i.e., the aspectual BECOME component or a directional preposition), (2) the change-of-state  $\text{Pred}^0$  is semantically (and phonologically) identical to the “static”  $\text{Pred}^0$ , but has different Case-assigning properties. I will first demonstrate how the Case Theory in (11) deals with the issue, and then argue that making  $\text{Pred}^0$  responsible for Finnish predicate Case patterns leads to incorrect predictions.

### 5.1. The morpho-syntax of change of state

As argued by Fong (2003), translative case on predicates is not a semantic or inherent case, but depends on the semantics of the embedding verb. This can be implemented by the assumption that the complement of a change-of-state verb contains an aspectual  $v^0$  head BECOME (22a) or that a change-of-state verb bears an aspectual feature [BECOME] (22b). The BECOME component, wherever it resides, is responsible for the assignment of the [affected] Case feature. (To simplify the representations, the causative component of such structures is set aside here.)



Under the assumption that  $\text{Pred}^0$  assigns the Case feature [predicative] as before, the relevant fragment of vocabulary insertion rules for Finnish could look as follows:

(23) **Vocabulary insertion rules (a fragment):**

- [predicative, affected] → TRS
- [predicative] → ESS
- [nominative] → NOM
- [accusative] → ACC

Once again it is underspecification that is responsible for the fact that the presence of the [affected] Case feature on the small clause subject does not

affect its surface case (accusative or nominative); conversely, the choice of the surface case of the predicate is not affected by the assignment of [nominative] or [accusative] by a higher head. Another immediate result of this approach is that translative is more marked than essive for the same reason that accusative is more marked than nominative: the feature matrix that surfaces as translative always contains the Case feature that surfaces as essive.

The advantage of such an analysis is twofold: On the one hand, it allows us to maintain a single  $\text{Pred}^0$  approach to all small clauses. On the other hand, since the Case feature [affected] corresponds to one of the interpretable features that make up the embedding verb, this analysis permits for a uniform treatment of potentially different syntactic structures: whereas in resultatives, the BECOME component may be projected as  $v^0$ , such is probably not the case for verbs like *become*, where BECOME is probably part of  $V^0$ .

## 5.2. More than one $\text{Pred}^0$

In the standard Case Theory, only one Case can be assigned to an xNP. Thus if in “static” small clauses  $\text{Pred}^0$  assigns essive, in change-of-state small clauses a different  $\text{Pred}^0$  is required.

Supposing that the change-of-state  $\text{Pred}^0$  is semantically vacuous is an obvious stipulation, since it requires the existence of two heads distinguishable only by their Case-assigning properties. To implement the syntactic difference between the two  $\text{Pred}$  heads, a diacritic feature would need to be used, which seems incompatible with the minimalist assumption that Case is an artifact of  $\phi$ -feature valuation.

The assumption that the translative-assigning  $\text{Pred}^0$  has the semantics of the aspectual head BECOME is also problematic. For the verb *become* itself projecting the BECOME component inside its small clause complement entails that *become* has no semantics at all and cannot be differentiated from *be*.<sup>21</sup> For the resultative construction, it means encoding the change-of-state semantics twice: once in lexical entry for the embedding verb and once inside the small clause. In essence, it would mean replicating on  $\text{Pred}^0$  the intuitive distinction between the “dynamic” verbs in the *elect*, *nominate*, *make*, etc., class and the “static” verbs in *seem*, *consider*, etc., class.

A possible objection to this consideration can be drawn from the fact that certain change-of-state verbs taking a small clause complement require a particular preposition (see also the examples in fn. 14):

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21 A possible objection involves the incorporation of the change-of-state  $\text{Pred}^0$  into a (light) matrix verb, with the resulting complex spelled out as *become* (or *make*). The problem with such a view is extending it to *remain* and naming verbs, and to the resultative construction.

- (24) a. The magician turned the princess **\*(into)** a frog.  
 b. Abby was taken **\*(for)** an expert.

It could be argued that translative is assigned by the null variant of the directional prepositions in (24), while the default essive case is linked to non-directional, complementizer-like functional heads, like those in (25). Such an analysis provides a natural explanation of the original locative meaning of the translative case. The bold elements in (24) and (25) have been assumed to be the overt counterparts of the null  $\text{Pred}^0$  (Aarts 1992, Bowers 1993, etc.).

- (25) a. They regarded the proposal **as** foolish.  
 b. The little girl was treated **like** a VIP.

The main reason to believe that the “overt predicators” in (24) and (25) play an active semantic role is the fact that in English a directional preposition is used only if the meaning of the main verb is not itself compatible with propositional content – as illustrated in (26), with true change-of-state verbs a directional preposition is impossible.<sup>22</sup> Therefore, it can be reasonably argued that a directional preposition enables a non-propositional verb to combine with its propositional complement.

- (26) a. The queen made her lover (**#into/\*to**) a treasurer.  
 b. Lou became (**\*into/\*to**) a professor.

Whatever the semantic effect of the directional preposition, it provides no reason to believe that the directional preposition is the head of the small clause. Instead, if the hypothesis above is correct, it is much more likely that it takes the small clause as a complement (denoting the final state of affairs, for change-of-state constructions), with subsequent movement of the subject:

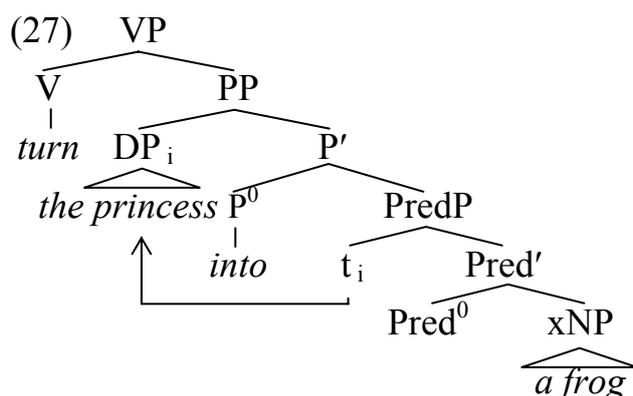
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22 Such is not the case with *as* or *like*, which obviously contribute a particular meaning loosely viewed as that of a comparison. Even when *as* is used with *consider*, a subtle difference in meaning can nonetheless be detected, particularly clear in (ib).

- (i) a. Do you consider cribbing (**as**) a form of cheating?  
 b. Would you consider newspapers (**as**) a potential source of data?

Conversely, (iia) does not involve a small clause structure at all, as shown by the availability of (iib), where the xNP following *to* is not a predicate (the fact demonstrated by iic):

- (ii) a. Betsy was promoted **\*(to)** chairman.  
 b. Betsy was promoted **to** the position of chairman.  
 c. Betsy was (**\*to**) the position of chairman.



Starke (1995) provides further evidence for this view. First of all, if the preposition were the head of the small clause with no further functional heads, the constituent containing the preposition and the predicate would correspond to an intermediate X' level or a segment. It would be then unexpected that it can move stranding the subject (see Williams 1983, Kitagawa 1985 and Svenonius 1996) or combine with negation (Cardinaletti and Guasti 1993). The behavior of floated quantifiers in small clauses also seems to suggest the structure in (27) (Sportiche 1995, Starke 1995). We conclude that not only do “overt predicators” provide no evidence for a “dynamic” Pred<sup>0</sup>, in fact they provide further support for a single Pred<sup>0</sup> in all small clauses. Therefore, even if Finnish translative corresponds to or is assigned by a null counterpart of the directional preposition, this counterpart, being external to the small clause and thus higher than the small clause subject, does not resolve the issue of multiple case assignment and is furthermore subject to the locality concerns discussed in section 3.1.

## 6. Independent motivation: Russian cardinals

Cross-linguistically, there exists a plethora of environments where more than one Case can be argued, both on syntactic and morphological grounds, to be assigned to a particular constituent even when this constituent is marked with one morphological case only. One example is the Slavic Genitive of Negation (Babby 1980, Pesetsky 1982); another is the partitive/accusative alternation (Kiparsky 2001) in Finnish. Due to the of space, I will only discuss case-marking with Russian cardinals here; the same pattern obtains in Finnish.

As is well-known (see Mel'čuk 1985, Babby 1987, Franks 1994, among others), Case marking in a Russian xNP containing a cardinal depends on the case assigned to that xNP. If the xNP is assigned a direct/structural case (nominative or accusative), the lexical noun (and its xAP modifiers) are case-

marked by the cardinal (usually genitive);<sup>23</sup> if the xNP is assigned an oblique case (genitive, dative, locative or instrumental), the lexical noun is marked with that case. The cardinal itself is marked with the case assigned to the entire xNP. The pattern is obviously different for a partitive or possessive genitive, which persists no matter what case is assigned to the entire xNP:

- (28) a. *tridcat' šagov*  
 thirty<sub>NOM/ACC</sub> steps<sub>GEN</sub>  
 b. *tridcat'ju šagami*  
 thirty<sub>INSTR</sub> steps<sub>INSTR</sub>  
 c. *v tridcati šagax*  
 in thirty<sub>LOC</sub> steps<sub>LOC</sub>
- (29) a. *bol'sinstvo šagov*  
 majority<sub>NOM/ACC</sub> steps<sub>GEN</sub>  
 b. *bol'sinstvom šagov*  
 majority<sub>INSTR</sub> steps<sub>GEN</sub>

Whatever the internal structure of a cardinal-containing xNP may be (see Franks 1994, Ionin and Matushansky 2006, among others), it does not affect the main point: whatever head it is that assigns genitive, why does it fail to do so when the entire xNP is assigned an oblique case – and if it doesn't, how is multiple case assignment resolved?

In the system I propose, the answer is straightforward: case is assigned to the totality of the xNP, and oblique cases, being more marked, are ordered before the direct cases in vocabulary insertion rules, and thus override them.<sup>24</sup>

## 7. Conclusion

The standard Case Theory is extremely restricted in its scope and has nothing to say about the vast majority of Case phenomena. The new Case Theory that I

23 Not all cardinals assign the same case. See Hurford (1975), Mel'čuk (1985), Babby (1987), Franks (1994) and Ionin and Matushansky (2006), etc., for the exact patterns involved.

24 The difference between the genitive assigned with a cardinal and the genitive assigned with a regular noun also requires an explanation, in any Case Theory. One possible explanation relies on the unexplored topic of what constitutes a barrier to Case assignment: it could be that a cardinal, being “more functional” than a lexical noun, does not introduce such a barrier. An alternative proposal would be to assume that the genitive assigned by a cardinal corresponds to a different underlying feature bundle than other xNP-internal genitives, and is therefore not treated the same by the vocabulary insertion rules for oblique cases.

proposed here can account not only for the standard facts but also for predicate Case-marking.

On the assumption that surface case is determined by language-specific vocabulary insertion rules and may not reflect all the case-features assigned to the term (syncretism), Case-agreement (e.g., in Latin) results from Case-assignment by  $v^0$  or  $T^0$  to its complement on the assumption that  $\text{Pred}^0$  assigns no Case features. Russian instrumental case is the spellout of the Case feature bundle assigned by  $\text{Pred}^0$  and by an event-related  $v^0$ . Finally, the translative case in Finnish is the spellout of the Case feature bundle assigned by  $\text{Pred}^0$  and by the  $\text{BECOME } v^0$  or [BECOME] feature of the verb.

The proposal that syntactic Case can be decomposed permits us to reconnect the syntactic Case Theory to morphological case feature systems (see Blake 1994 (section 2.3) for an overview), while also providing a clearer definition of the syntactic notion of abstract Case. Combined with standard Distributed Morphology assumptions about vocabulary insertion, it yields a morphosyntactic account of how multiple case assignment is resolved and where (part of) cross-linguistic variation in Case assignment to predicates resides: (a) the ability of a given head to assign Case, and (b) language-specific vocabulary insertion rules. As a result, we can deal with multiple Case assignment in environments other than predicate Case, and we also obtain a principled view of Case as a redundancy-increasing method of marking the derivational history of a tree on its leaves, which makes it clearer why case-marking may be underspecified or absent.

Several issues are left open by this article, including such problems as expletive choice, PRO licensing, the nature of EPP and the interaction of overt Case with movement, all of which have frequently been viewed as part of the domain of Case Theory. Among the many research topics which I believe can be adequately treated by the new Case Theory are default and inherent Case, and ergative/absolutive and mixed Case systems. Barriers to Case percolation have also been left aside, as has been the variation between Case agreement and predicate Case assignment determined by the argument/adjunct distinction (Serbo-Croatian; see Bailyn 2001) or by finer details of the lexical semantics of the verb (as in Georgian or Hungarian). These omissions notwithstanding, I hope to have demonstrated that the new Case Theory can account for the facts that the standard Case Theory has treated as well as deal with phenomena that it has not.

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Lucie Medová

## Reflexive clitics, Movement and Layered Case\*

### 1. Explanandum

Sentences with ACC reflexive clitic (1) can have two readings: an impersonal reading, as *one washes kids every day* and on the other hand a true reflexive reading<sup>1,2</sup>, as *the kids wash themselves every day*.

- (1) *Děti se mejou každéj den.*  
 Kids<sub>NOM</sub> SE<sub>ACC</sub> wash<sub>3.PL</sub> every day  
 1. REFL: 'Kids wash themselves every day.'  
 2. IMP: 'One washes kids every day.'

When an ACC reflexive clitic is replaced with a DAT reflexive clitic, only the true reflexive reading is available, the impersonal reading is simply impossible. Starting with a base sentence in (2) with a DAT and ACC argument, we derive sentences in (3). While the sentence (3a) with the ACC object reflexivized (thus with an ACC reflexive clitic *se*) is interpreted impersonally, the sentence in (3b), with a reflexivized DAT argument (and thus with the reflexive DAT clitic *si*) lacks the impersonal reading. The only reading available for the

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\* I would like to thank the audience of FDSL 6.5 in Nova Gorica and two anonymous reviewers for the comments. I am grateful to Tarald Taraldsen and Pavel Caha for all the discussions we had on this topic and to Antonio Fabregas for clarification of the Spanish data. The Czech data are a part of Colloquial Czech based on the author's native intuitions.

- 1 In this article, I do not draw any distinction between a reciprocal reading and a reflexive reading and I subsume both under a true reflexive. In the same vein, I do not distinguish between impersonal and passive readings and label them both as impersonal.
- 2 Such an ambiguity can be found in all Slavic languages (which have reflexive clitics disqualifying thus Russian) with the exception of Polish. That is, all Slavic languages have invariably the reflexive SE construction with the NOM subject, for Polish shown in (i). The impersonal SE construction, on the other hand, appears with ACC DP (obligatorily in Polish, as shown in (ii), and optionally in Slovene and Serbian) or NOM DP (all Slavic languages but Polish). In this paper, I discuss only the impersonal SE with DP in NOM, as such a structure is potentially ambiguous between the reflexive and impersonal reading.

(i) *Janek ubiera się.* (ii) *Tę książkę czytało się s przyjemnością.*  
 Janek<sub>NOM</sub> dress<sub>3.SG</sub> SE this book<sub>ACC</sub> read<sub>3.SG</sub> SE with pleasure  
 'Janek gets dressed.' 'People read this book with pleasure.'  
 Rivero & Sheppard (2003): (1a),(10a)

DAT reflexive clitic is a true reflexive reading. This observation, exemplified for Czech, is valid also for other languages with reflexive clitics within Slavic and Romance families. So, why cannot a reflexive DAT clitic *si* give arise to an impersonal reading?

- (2) *Rodiče dávaj dětem karamely k vánocům.*  
 parents<sub>NOM</sub> give<sub>3.PL</sub> kids<sub>DAT</sub> candy<sub>ACC</sub> for Christmas  
 'Parents give candy to kids for Christmas.'
- (3) a. *Karamely se dávaj dětem k vánocům.*  
 candy<sub>ACC</sub> SE<sub>ACC</sub> give<sub>3.PL</sub> kids<sub>DAT</sub> for Christmas  
 1. \*REFL: 'Candy gives itself to kids for Christmas.'  
 2. IMP: 'One gives candy to children for Christmas.'
- b. *Děti si dávaj karamely k vánocům.*  
 kids<sub>NOM</sub> SE<sub>DAT</sub> give<sub>3.PL</sub> candy<sub>ACC</sub> for Christmas  
 1. REFL: 'Kids give candy to each other for Christmas.'  
 2. \*IMP: \*'One gives candy to children for Christmas.'

The second question I want to find an answer to is the DAT intervention effect. Starting with the base sentence in (4) the ACC object *děti* is reflexivized, as shown in (5a)<sup>3</sup>. However, contrary to the expectation one might have from the example (1), (5a) does not have a true reflexive reading, but it must be read only impersonally. To get a reflexive reading, the plain DAT *rodičům* must be replaced by a DP with a preposition *k* 'to', governing, incidentally, also DAT (5b). The relevant observation is that the plain DAT blocks a reflexive reading.

- (4) *Učitelé vracej děti rodičům.*  
 teachers<sub>NOM</sub> return<sub>3.PL</sub> kids<sub>ACC</sub> parents<sub>DAT</sub>  
 'The teachers return the kids to the parents.'
- (5) a. *Děti se vracej rodičům.*  
 kids<sub>NOM</sub> SE<sub>ACC</sub> return<sub>3.PL</sub> parents<sub>DAT</sub>  
 1. \*REFL: \*'The kids return (themselves) to their parents.'  
 2. IMP: 'The kids are being returned to their parents.'
- b. *Děti se vracej k rodičům.*  
 kids<sub>NOM</sub> SE<sub>ACC</sub> return<sub>3.PL</sub> to parents<sub>DAT</sub>  
 REFL 'The kids return to their parents.'

3 The examples in (5) appeared in Růžička (1992) for Russian. Incidentally, my informants find these examples impossible in Russian. Here I use an appropriate Czech version.

The blocking effect of the reflexive reading by the intervening DAT is found in analytical causatives both in Czech (6) and in Italian (7) (Tarald Taraldsen, p.c.). The (a) example shows a causative where the subject of the infinitive embedded under a causative verb (*dát* 'give' in Czech and *fare* 'make' in Italian) is expressed as DAT: *Michalovi* in (6a) and *al papà* in (7a). However, when the complex structure is reflexivized, as in the (b) examples, the DAT is impossible and the agent of the infinitival event has to be expressed as an adjunct (*od Michala* in (6b) and *dal papà* in (7b)).

- (6) a. *Efka dala Michalovi osušit Jáchyma.*  
 Efka<sub>NOM</sub> gave<sub>3.SG</sub> Michal<sub>DAT</sub> dry<sub>INF</sub> Jáchym<sub>ACC</sub>  
 'Efka gave Jáchym<sub>1</sub> to Michal to dry him<sub>1</sub> off.'
- b. *Jáchym se dal osušit \*Michalovi / od Michala.*  
 Jáchym<sub>NOM</sub> SE gave<sub>3.SG</sub> dry<sub>INF</sub> Michal<sub>DAT</sub> / from Michal<sub>GEN</sub>  
 'Jáchym made himself dry off by Michal.'
- (7) a. *Elena fa aiutare Ole al papà.*  
 Elena make<sub>3.SG</sub> help<sub>INF</sub> Ole daddy<sub>DAT</sub>  
 'Elena makes daddy help Ole.'
- b. *Ole si fa aiutare \*al papà / dal papà.*  
 Ole SE make<sub>3.SG</sub> help<sub>INF</sub> daddy<sub>DAT</sub> / from.the daddy  
 'Ole<sub>1</sub> makes daddy to help him<sub>1</sub>.'

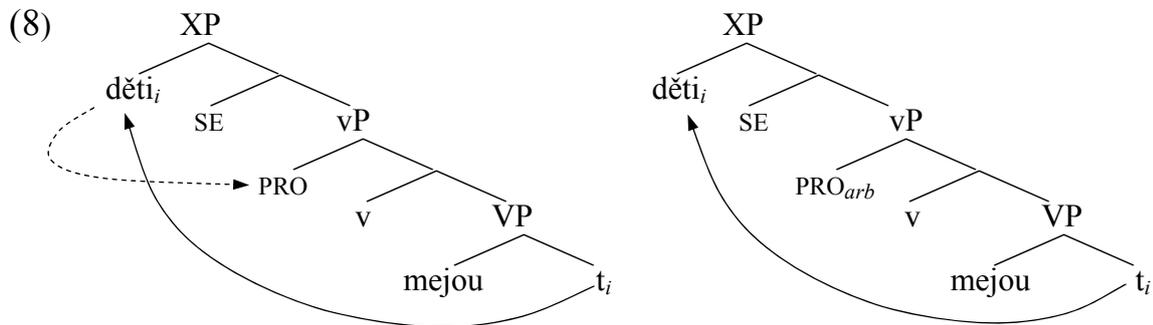
In the following, I propose an explanation for both the lack of impersonal DAT *si* and the blocking effect of a reflexive reading by a DAT argument based on an interaction between movement and a particular theory of case.

I make one more assumption: following Kayne (1986) in particular, I strive for a unified analysis of all uses of SE. The only way to unify all the different uses of SE (next to reflexive and impersonal treated here there are also anticausative, middle, passive, etc.) is unaccusative approach, of which Kayne (1986) is an example I discuss in the next section. For detailed discussion see Medová (in preparation).

## 2. SE Unified

If one follows Kayne (1986) in the effort to unify the impersonal and true reflexive uses of SE, it is not directly obvious how one finds an answer to the puzzles in section 1. Following Kayne's ideas, the NOM argument *děti* in (1) raises from the internal argument position not only for the impersonal reading, but also for the true reflexive reading, as shown in the trees in (8). In both cases,

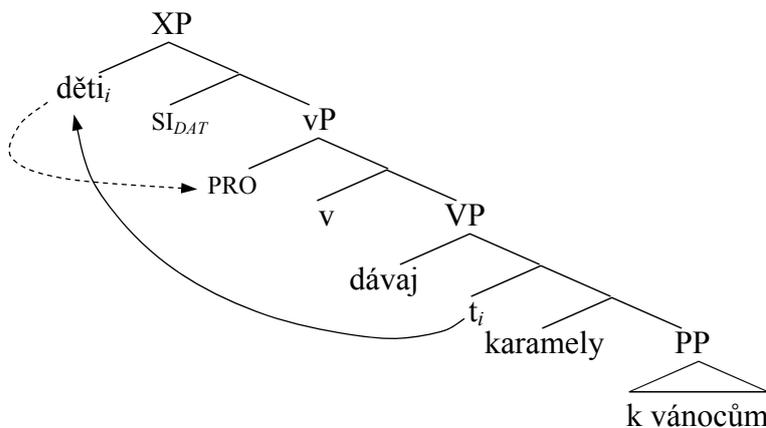
furthermore, the external argument is PRO. SE is on this view a head above the external argument.



The interpretative difference between the reflexive reading and the impersonal reading depends on the status of PRO: if PRO is governed by the raised argument (as shown by the dashed line on the left hand tree in (8)), the structure has a reflexive reading. Otherwise the arbitrary PRO interpretation gives an impersonal reading.

With this analysis, the problems from section 1 are still rather puzzling. In fact, if impersonal and reflexives are derived essentially the same way, the lack of impersonal DAT *si* is a pure stipulation: the raised DAT argument *has* to control the PRO, while raised ACC has both options: it either controls the PRO (and the reflexive reading is gotten), or it does not control the PRO leading to an impersonal reading. The structure of the reflexive (3b) is shown in (9) below.

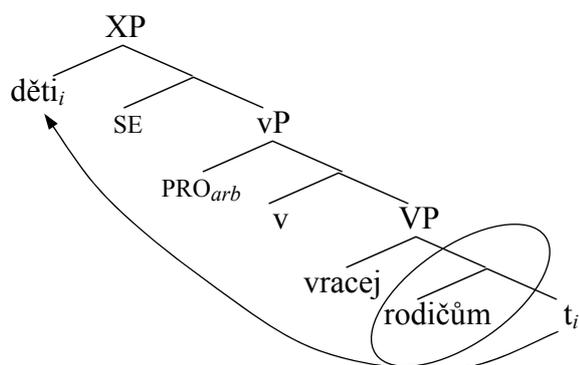
- (9) *Děti si dávají karamely k vánocům.*  
 kids<sub>NOM</sub> SE<sub>DAT</sub> give<sub>3.PL</sub> candy<sub>ACC</sub> for Christmas  
 1. REFL: 'Kids give candy to each other for Christmas.'  
 2. \*IMP: \*'One gives candy to children for Christmas.'



The DAT intervention effect (5a), repeated in (10) below, requires a similar stipulation. Since we know that an ACC argument can raise across the DAT

and still have the impersonal interpretation (as witnessed by (3a)), it is not clear why should the in-situ DAT argument block the ability of the raised ACC to control the PRO. That is, the DP raised across the (overt) DAT in (10) becomes unable to control the PRO, hence unable to give rise to a true reflexive reading, hence, only impersonal reading obtains for (10). But why should that be so?

- (10) *Děti se vracej rodičům.*  
 kids<sub>NOM</sub> SE<sub>ACC</sub> return<sub>3.PL</sub> parents<sub>DAT</sub>  
 1. \*REFL: \*'The kids return (themselves) to their parents.'  
 2. IMP: 'The kids are being returned to their parents.'

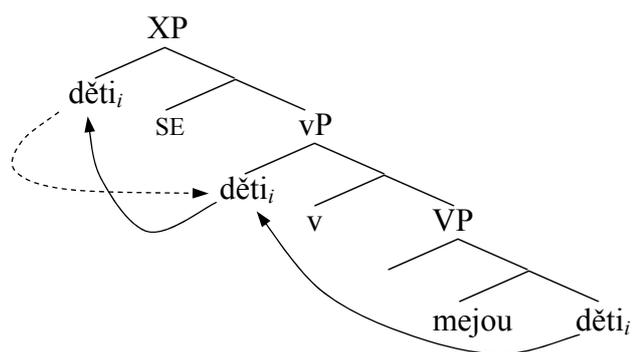


Now we are in an awkward position: on the one hand, we have an analysis which could unify all the uses of SE (although we discussed only reflexive and impersonal above); on the other, this analysis is at lost with the problems introduced in section 1. Rather than give up, I introduce an update of this analysis in the following section.

### 3. Control via Movement

If Hornstein (1999) is right about control in general, then Kayne's analysis of impersonal and true reflexives needs modification anyway. For Hornstein, control arises via DP-movement from one  $\theta$ -position to another. Applying this to Kayne's structures above, the PRO is replaced by a trace of the moved DP, as shown in (11), giving the structure for a reflexive reading of (1).

- (11) *Děti se mejou každéj den.*  
 Kids<sub>NOM</sub> SE<sub>ACC</sub> wash<sub>3.PL</sub> every day  
 → 1. REFL: 'Kids wash themselves every day.'  
 (2. IMP: 'One washes kids every day.')



Such an analysis of reflexives has been proposed by Alboiu et al. (2004). The updated version of this derivation of reflexives has a clear advantage: it allows to see reflexives as unergatives while it at least leaves the possibility for a unified analysis of all the uses of SE.

If the DP moves via the external argument position and if the  $\theta$ -role assignment is contingent upon that movement, it follows that the moved element *děti* is predicted to show unergative behavior: it – in addition to the internal  $\theta$ -role from the direct object position – also acquired the external one. That is, if unergative behavior is seen as directly dependent on a 'possession' of an external  $\theta$ -role, the true reflexives are predicted to be unergative, complying thus with the robust evidence of unergative nature of reflexives, cf. Reinhart & Siloni (2004, 2005)<sup>4</sup>.

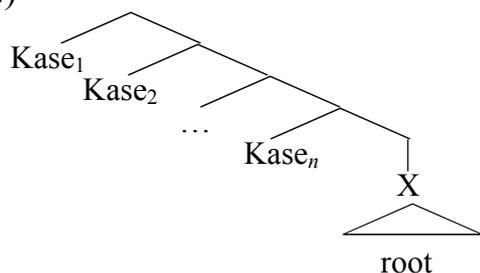
But still, even this updated version of the unified analysis of SE does not offer any insights for the puzzles in section 1. To get closer to their solution, it seems necessary to bring in a specific assumptions about case.

#### 4. Layered Case

Starke (2005) and Caha (2006) propose a specific view of case assignment. As it is rather standard in the recent theory (starting at least with Toman (1994) and further developed in Bayer *et al.* (2001), Svenonius (2004), Asbury (2006), among others), case is seen as a functional head (Kase). In this theory, however, each Kase heads its own projection. Additionally, the Kase heads are stuck on top of the DP, within the extended DP region, as illustrated schematically in (10). Kase<sub>1</sub>...Kase<sub>n</sub> layers should be thought of as an instances of a real morphological case, as nominative or dative.

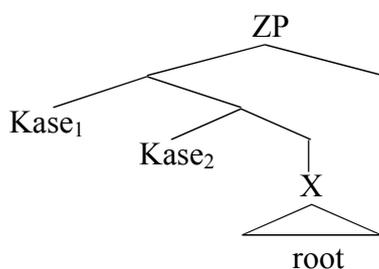
4 On the other hand, if the impersonal SE shows unaccusative characteristics, as shown in Reinhart & Siloni (2004), it cannot be derived exactly as the true reflexives: crucially, the moved DP does not go through the external argument position; for detailed analysis see Medová (in preparation).

(12)



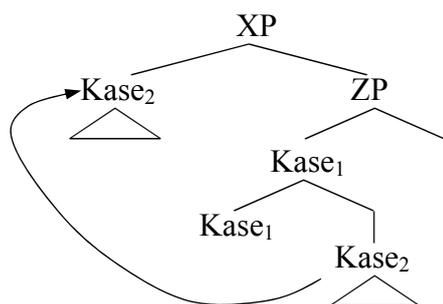
Here is the mechanics. Suppose for now that we have only two Kases:  $Kase_1$  on top of  $Kase_2$  on top of the DP. The DP then merges in the ZP, as illustrated in (13).

(13)



How does a DP then ever appear in a particular case, say,  $Kase_2$ ? This is guaranteed by *peeling*. One Kase layer can extract from within another Kase layer and rise to a higher position on the extended verbal projection line. Crucially, however, only the complement of the highest head can extract, as illustrated in (14).

(14)

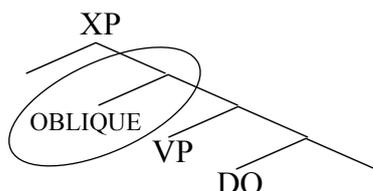


Concretely, if the  $Kase_2$  is the complement of  $Kase_1$  and if the  $Kase_1$  is the highest head (the top layer of the stack), as in (14), then  $Kase_2$  can extract from under  $Kase_1$  and move up to a verbal projection line, leaving behind stranded  $Kase_1$  layer. The stranded  $Kase_1$  layer is spelled out as a part of ZP.

## 5. Implementation

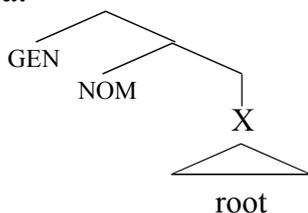
For their analyses of *have/be* alternations, Kayne (1993) and Mahajan (1994) proposed that an external argument is associated with an oblique case, as shown in (15).

(15)

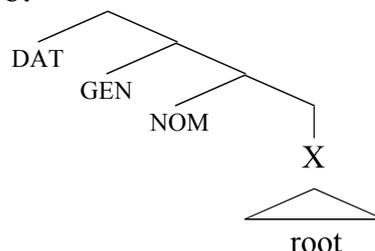


I will assume that the oblique case associated with the external argument is genitive, as shown in (16a). In other words, if a DP is merged as an external argument, it has a GEN Kase layer on top of NOM Kase layer. For it to become NOM, the NOM Kase layer with its complement raises to the relevant position, as peeling has it. Furthermore, DAT comes on top of the GEN in the nominal sequence (16b).<sup>5,6</sup>

(16) a.



b.



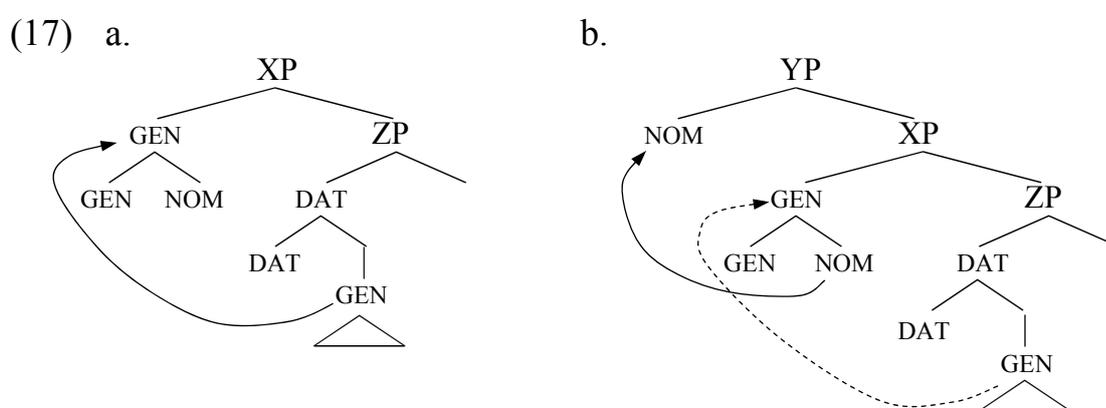
This is the last assumption needed to explain the puzzles from section 1. First, I will derive the impossibility of impersonal DAT reflexive *si* and then, in the section 5.3., the DAT intervention effect. Section 5.2. shortly discusses the

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- 5 For example, the sequence GEN-NOM is instantiated in the plural feminine paradigm by the morpheme *-í*: *ruž-í* 'roses-GEN', the DAT layer on top appears as an additional morpheme *-m* on top of the GEN-NOM layer: *ruž-í-m* 'roses-GEN-DAT'. The anonymous reviewer objects that there is no peeling and that what we see is a simple instance of case syncretism. Of course one could say that, but it just should not be the first theoretical option. For detailed discussion, see Caha (2006) and Caha (to appear).
- 6 The nature of the peeling theory requires that all the morphological cases should be lined up on top of a DP. In this particular implementation, however, I consider just DAT - GEN - NOM sequence. On the other hand, see Caha (2006) for sequence INSTR - ACC - NOM and Caha (to appear) for a line-up of all morphological cases in Czech.

impersonal reading and finally, section 5.4. brings in further support for this particular view of reflexives.

### 5.1. DAT entails true reflexive reading

(17) shows how the derivation of a reflexive structure proceeds when we start out with a DP from (16b). First, in (17a) the GEN moves out of DAT. Then, in (17b) the NOM peels from under the GEN. Notice, that the general framework setup does not allow the NOM to move from under the GEN to the NOM (YP in (17b)) position directly, without peeling the GEN layer first.



If true reflexive reading arises when a DP is moved to a NOM position via the external argument position (section 3) and if the external argument position is a GEN position (section 5), then it must be the case that at least certain direct objects actually contain a GEN-layer in their Kase structure. Consequently, all the objects that reflexivize should appear in the base structure (cf. in the direct object position) as DAT. In other words, to derive a reflexive reading, the DP has to start with a structure (16b) with a NOM embedded under GEN embedded under DAT in turn to be forced to move via the GEN (=external argument) position to peel the structure off. So, are all the direct objects that reflexivize DAT?

To start carefully, Spanish (18) shows that a direct object *can* be a morphological DAT. Crucially, however, Spanish also shows that only *animate* direct objects derive true reflexive reading (19)<sup>7</sup>.

7 Stative predicates in Spanish mark (all) the objects as DAT (i). Yet, in a bizarre world where such things are conceivable, only animate nouns could reflexivize (ii), but not inanimates (iii): (iii) has impersonal or middle (dispositional) reading only. I am grateful to Antonio Fabregas for the data discussion.

(i) *Estos materiales oxida \*(a) los metales / \*(a) Buffy.*  
 the material oxidates the metal / Buffy  
 'The material oxidates the metal / Buffy.'

- (18) a. *Vi a Antonio.*  
 saw<sub>1.SG.</sub> a<sub>DAT</sub> Antonio  
 'I saw Antonio.'
- b. *Vi (\*a) un libro.*  
 saw<sub>1.SG.</sub> DAT a book  
 'I saw a book.'
- (19) a. *Antonio se vio.*  
 Antonio SE saw<sub>3.SG</sub>  
 'Antonio saw himself.'
- b. *Un libro se vio.*  
 a book SE saw<sub>3.PL</sub>  
 \*REFL: 'A book saw itself.'  
 IMP: 'A book was seen. / One saw a book.'

The true reflexive reading is available only for animate nouns (and exactly those are marked as DAT in Spanish and other Romance dialects, cf. section 5.4.). Further, by assumption (section 3.), the true reflexive reading is contingent upon the DP movement via an external argument position and it is only the animate nouns that can do that (cf. contrast between (19a) and (19b)). Other languages than Spanish show true reflexive readings as well (cf. Czech (1)), but just like in Spanish, only for animate nouns (cf. contrast between (3a) and (3b) and further discussion in section 5.3.). Translated into the assumptions here, only the animate nouns have the appropriate piece of structure to move via the external argument position and thus yield the reflexive reading (further evidence follows in section 5.4.).

So, why are not all languages like Spanish? In essence, all languages that show true reflexives *are* like Spanish, except that for some reason (to be explored in further research), the animate direct objects have to peel further up to a structural ACC and thus they appear marked as ACC (but see also section 5.4. for potential supporting evidence for animacy distinctions at play).

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- (ii) *Buffy se oxida a sí misma.*  
 Buffy SE oxidates to SE self  
 'Buffy oxidates herself.'
- (iii) *Los metales se oxidan (\*a sí mismos).*  
 the metal SE oxidates to SE self  
 IMP 'One oxidates the metal with the material.'  
 MIDDLE 'The metal oxidates (easily) with the material.'

## 5.2. Impersonal reading

To derive an impersonal reading, as for instance *One washes kids every day*, from (1), repeated here as (20), an animate direct object must also be able to lack the GEN layer. That is, the impersonal reading is derived by the movement of the DP *děti* 'kids' from the direct object position to the NOM position without the stopover at the external argument position.

- (20) *Děti se mejou každé den.*  
 Kids<sub>NOM</sub> SE<sub>ACC</sub> wash<sub>3.PL</sub> every day  
 (1. REFL: 'Kids wash themselves every day.' )  
 →2. IMP: 'One washes kids every day.'

Inanimate nouns, on this story, do not have enough structure to mimic the movement of the animate nouns. That is, the inanimate direct objects do not have the extra structure that forces the movement via the external argument position. In other words, the animate nouns are predicted to be bigger than inanimates for the GEN layer of Kase.<sup>8</sup>

## 5.3. The DAT intervention effect

The DAT intervention effect, (5a), repeated here as (21), follows immediately from the assumption that an external argument is closer to the indirect object than to the direct object.

- (21) *Děti se vracej rodičům.*  
 kids<sub>NOM</sub> SE<sub>ACC</sub> return<sub>3.PL</sub> parents<sub>DAT</sub>  
 1. \*REFL: \*'The kids return (themselves) to their parents.'  
 2. IMP: 'The kids are being returned to their parents.'

From that perspective, then, the GEN layer from inside the indirect object is closer to the external argument position than the GEN layer from inside the direct object position.

Under the assumptions made here it is only the true reflexive reading that should be blocked by the DAT intervener: only for the true reflexive reading must the DP from the direct object position rise to the NOM position via the external argument. Crucially, it is argued that only *animate* DPs are able to

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8 This does *not* entail that (i) the inanimates cannot appear as GEN and that (ii) inanimates can never be external arguments. From the story above it only appears that they cannot do that if they are derived by the movement from the direct object position. Again, further research will have to be done to find an answer.

reflexivize<sup>9</sup>. An *inanimate* DP does not (and cannot, as it lacks the GEN-layer) move via the external argument position. With inanimate NOM (raised from the direct object position), the DAT does not cause any intervention, as shown in (22). Consequently, the reading is not reflexive, but anticausative (22a) or impersonal (22b).<sup>10</sup>

- (22) a. *Spalničky se pacientům (obvykle) vracej.*  
 measles<sub>NOM.PL</sub> SE<sub>ACC</sub> patient<sub>DAT.PL</sub> usually return<sub>3.PL</sub>  
 ANTIC: 'Patients usually get the measles back.'
- b. *Indexy se studentům vracejí 25. června.*  
 student.record.book<sub>NOM.PL</sub> SE<sub>ACC</sub> student<sub>DAT</sub> return<sub>3.PL</sub> 25 June  
 IMP: 'Students get their record books on June 25.'

Another example of the DAT intervention in a reflexive reading is in (23b): the impersonal reading is only marginal, the reflexive is absolutely out.

9 Incidentally, the Czech National Corpus (ČNK) has examples of *return* in a reflexive reading with the DAT argument, as (i). However, the DAT is always a clitic / weak pronoun and never a full DP. I suggest that these DAT are instances of ethical DAT, in any event, different from the intervention causing DAT, as shown in (ii), when the weak pronoun *nám* is substituted with a full DP.

- (i) ... *náš fackovací paňáček se nám vrátil.*  
 our whipping boy<sub>NOM</sub> SE<sub>ACC</sub> us<sub>DAT</sub> return<sub>3.SG</sub>  
 'Our whipping boy came back on us.'
- (ii) ... *fackovací paňáček se studentům vrátil.*  
 whipping boy<sub>NOM</sub> SE<sub>ACC</sub> students<sub>DAT</sub> return<sub>3.SG</sub>  
 \*REFL: \*'The whipping boy came back to the students.'  
 IMP: 'The whipping boy was returned to the students.'

10 (i) seems to constitute a counterexample to the intervention effect of the reflexive reading with a DAT argument. That is, the original (animate) ACC object can reflexivize and the true reflexive reading is obtained. However, as (ii) shows, even though the direct object of this verb does not need to be animate, 'anticausativized' (raised to the NOM position, without the stop over at the external argument position) inanimate direct object is impossible (iii). More work needs to be done on this pattern.

- (i) *Jan se představil Marii.*  
 Jan<sub>NOM</sub> SE<sub>ACC</sub> introduced<sub>3.SG</sub> Marie<sub>DAT</sub>  
 REFL: 'Jan introduced himself to Marie.'
- (ii) ?*Ředitel představil studentům možnost (odjet do Norska).*  
 director<sub>NOM</sub> introduced<sub>3.SG</sub> students<sub>DAT</sub> opportunity<sub>ACC</sub> leave<sub>INF</sub> to Norway  
 'The director introduced the opportunity to leave for Norway to the students.'
- (iii) \**Studentům se představila možnost (odjet do Norska).*  
 students<sub>DAT</sub> SE<sub>ACC</sub> introduced<sub>3.SG</sub> opportunity leave<sub>INF</sub> to Norway  
 Intended: 'An opportunity (to leave for Norway) introduced itself to students.'

- (23) a. *Petr se přidal ke komunistům.*  
 Petr<sub>NOM</sub> SE<sub>ACC</sub> add<sub>3.SG</sub> to communists<sub>DAT</sub>  
 'Petr aligned himself with communists.'
- b. #*Petr se přidal komunistům.*  
 Petr<sub>NOM</sub> SE<sub>ACC</sub> join<sub>3.PL</sub> communists<sub>DAT</sub>  
 1. \*REFL: 'Petr aligned himself with communists.'  
 2. #IMP: 'Petr was added to communists.'

Not all double object verbs with indirect object in DAT and direct object in ACC case follow the pattern of *vrátit* 'return'; two such examples are discussed in footnotes 9 and 10, another double object verb is shown in (24).

- (24) a. *Karel popsal Ivoně cestu.*  
 Karel<sub>NOM</sub> po-write<sub>3.SG</sub> Ivona<sub>DAT</sub> way<sub>ACC</sub>  
 'Karel described the way for Ivona.'
- b. *Karel se Ivoně popsal (do telefonu).*  
 Karel<sub>NOM</sub> SE<sub>ACC</sub> Ivona<sub>DAT</sub> po-write<sub>3.SG</sub> in phone  
 'Karel described himself over the phone to Ivona.'

What seems to be at play here is the type of the DAT argument. But as shown clearly by the cases of DAT intervention effect in the causatives in (6) and (7), the DAT must be higher than the direct object. So, the DAT in those double object verbs that do not show the intervention effect in the reflexive reading could be lower than the ACC. I leave the issue for further research.

#### 5.4. Animates are different

I observed that the true reflexive reading is available only for animate nouns. But is there any syntactic evidence that animate nouns indeed behave differently from inanimates? Or, for this story, is there any evidence that animate nouns have more structure than inanimates? I have three pieces of evidence at hand. First, for masculine animate nouns, Slavic languages show the ACC to GEN shift when the masculine animate noun appears in the direct object position; as shown in (25) for Czech. In other words, the Slavic languages show a similar shift observed for Spanish above (and other varieties of Romance below). Notice, however, that the Slavic ACC-to-GEN shift applies only to a subset of animate nouns, masculine animate nouns.

- (25) *Vidím Michal-a / hrad-Ø.*  
 see<sub>1.SG</sub> Michal<sub>GEN</sub> / castle<sub>ACC</sub>  
 'I see Michal / a castle.'

Second, similarly to Spanish, Romanian and plenty of Southern Italian dialects have a DAT form for the animate direct objects, while inanimate direct objects are not marked by the preposition *a* (or a special preposition PE, as shown in (26) for Romanian).

- (26) a. *L-am văzut pe Ion.*  
 him<sub>ACC</sub>-AUX<sub>1,PL</sub> seen PE Ion  
 'We saw Ion.'
- b. *Am văzut biserica.*  
 AUX<sub>1,PL</sub> seen church<sub>ACC</sub>  
 'We saw the church.'

Third, Czech has a special form for possessive adjectives created from singular animate nouns (27), this time both for masculine nouns (27a) and feminine nouns (27b). These forms are external arguments in nominalizations, as in (28a). Importantly, the very same morpheme -OV- (for masculine nouns) is also seen in the DAT forms (28b). As a matter of fact, the form *Hannibal-ov-i* could be an instantiation of the structure (16b), with the NOM layer embedded under GEN layer and further embedded under DAT layer. Crucially, the form with -OV- is grammatical only for masculine animate nouns and impossible for inanimate nouns (28b), bringing in the prediction of the inanimate nouns being smaller than animates by missing precisely the GEN layer: -OV-.

- (27) a. *Petr-ov-o / \*stroj-ov-o kolo.*  
 Petr-OV<sub>NOM,N,SG</sub> / machine-OV<sub>NOM,N,SG</sub> wheel<sub>NOM,N,SG</sub>  
 'Petr's bike / \*machine's wheel.'
- b. *Ivon-in-a / \*fakult-in-a kancelář.*  
 Ivona-IN<sub>NOM,F,SG</sub> / faculty-IN<sub>NOM,F,SG</sub> office<sub>NOM,F,SG</sub>  
 'Ivona's office / \*office of the faculty.'
- (28) a. *Hannibal-ov-o překročení Alp.*  
 Hannibal-OV<sub>NOM,N,SG</sub> cross<sub>NOM,N,SG</sub> the Alps<sub>GEN</sub>  
 'Hannibal's crossing of the Alps.'
- b. *Hannibal-ov-i / stroj-(\*ov)-i*  
 Hannibal-OV<sub>DAT</sub> / machine-OV<sub>DAT</sub>

## 6. Conclusion

Combining the control via movement approach with the Kase-peeling theory immediately derives solutions to the problems from section 1. I did not discuss the proper analysis of SE itself as I leave this (and other, above pointed) questions for further research.

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## Argument structure in Russian deverbal nouns in *-nie*\*

### 1. Problem

The main question addressed in this paper is as follows: what happens to the arguments of a transitive verb (like Russian *razrušit* ‘destroy’, (1a)), when the latter nominalizes, as in (1b)?<sup>1</sup>

- (1) a. *Vrag razruš-il gorod.*  
 enemy destroy<sub>PST.M.SG</sub> city  
 “The enemy destroyed the city.”
- b. *razruš-eni-e (gorod-a (vrag-om))*  
 destroy<sub>NMN-NOM</sub> city<sub>GEN.SG</sub> enemy<sub>INSTR.SG</sub>  
 “destruction (of the city (by the enemy))”

Comparing (1a) to (1b), three things are observable:

- a deverbal noun can have two NPs next to it, one of them denoting the former verbal object and the other the subject;
- the nominative-accusative frame disappears: the former object is expressed with a genitive NP (analogous to the English *of*-phrase) and the former subject with an instrumental NP (counterpart of the *by*-phrase);
- both of these NPs, or only the instrumental NP, can be omitted.

These observations cause some more precise questions:

(i) what is the nature of the two NPs in (1b) — are they the heirs of the verbal arguments, and if yes, is it correct both syntactically and semantically speaking, or only semantically, and if not, where have the arguments gone?

(ii) is the instrumental NP in (1b) the same as the instrumental NP expressing agents in passive constructions?

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\* I would like to express my gratitude to the reviewers and the audience of the FDSL 6,5 conference for helpful comments on my talk. My thanks also go to the volume reviewers for their thorough reading of the paper and numerous improvement suggestions, as well as to Sergey Tatevosov for fruitful discussions of several issues dealt with here.

1 Gloss-line abbreviations: PST – past tense, PRS – present tense, PPP – perfective past participle, INF – infinitive, 3 – 3d person, IN – verbal prefix ‘in, into’, REFL – reflexive morpheme, NMN – deverbal nominalizer, N – deadjectival nominalizer, SG – singular number, PL – plural number, F – feminine gender, M – masculine gender, NOM – nominative case, GEN – genitive case, DAT – dative case, ACC – accusative case, INSTR – instrumental case.

(iii) what are the mechanisms that derive (1b) from (1a) and allow for this inheritance of arguments, and where are they located?

Several hypotheses about the argument structure of deverbal nouns have been proposed, which try to account for the observed facts and have different answers to these questions. What I am going to do in this paper is to evaluate these hypotheses against the data of Russian nominalizations. The remainder of this paper is organized as follows. Section 2 examines the hypotheses I am going to look at. Section 3 introduces Russian data. Section 4 gives our analysis of these data in terms of the discussed hypotheses. Section 5 presents several conclusions of the discussion. In Section 6, I argue about some consequences of the proposed analysis and possibilities of expanding it to other languages.

## 2. Hypotheses

So far, at least three possible ways of answering the questions in (i)-(iii) have been proposed: let's call them External Argument Suppression Hypothesis, Passivization Hypothesis and Deficient  $\nu$ P Hypothesis.

### 2.1. External Argument Suppression Hypothesis

This hypothesis says that the instrumental NP in (1b) is not an argument of the deverbal noun but a pure adjunct, attached to the noun in the syntax during a late stage of the derivation. Semantically, it expresses the same participant of the situation as the verbal subject does, but syntactically it does not derive from it, and there is no need to look for a way to do it. There are two main ways of deriving "subjectless" verbal stems and deverbal nouns.

Both of them rely upon the view that of the two arguments a transitive verb has, one is internal, that is to say it is generated inside the VP and is predetermined by the lexical representation of the verbal stem, and the other is external, residing outside the maximal projection of V, in  $\nu$ P. In the most radical form of this proposal it is even argued that the external argument together with  $\nu$ P is merged only in the syntax (see Kratzer 1996, 2003).

Under this radical approach one can simply say that the deverbal noun is derived before attaching the external argument, in other words, lower than  $\nu$ P. For instance, one could claim that in a language only VPs can nominalize; this is actually what has been argued for Russian nominalizations in Schoorlemmer (1995) and for Polish nominalizations in Rappoport (2000, 2001).<sup>2</sup>

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2 Gilbert Rappoport (2000, 2001) argues that Russian nominalizations contain still less structure, i.e. only the lexical head  $V^0$ . This point, however, is not supported by the empirical data: Russian deverbal nominals can be formed from the verbal stems containing

The less radical approach says that in the course of nominalization, the external argument, originally expressed by the verbal subject, gets suppressed and eliminated from the argument structure (Grimshaw 1990). After this operation has taken place, a *by*-phrase adjunct, corresponding to this argument in the nominalized structure, can be attached, but doesn't need to.

This hypothesis, in both of its variants, perfectly accounts for the optionality of the instrumental NP and the absence of structural nominative and accusative cases within nominalizations. Indeed, nominalizations have no nominative, because there is no subject NP to need it, and no accusative, because there is no *vP* to assign it. As for the optionality of the expression of the object, it is claimed in Grimshaw (1990) that it is always present, even when unexpressed, and is by default existentially bound.

## 2.2. Passivization Hypothesis

This hypothesis takes seriously the fact that when a verb is nominalized the verbal subject can be expressed with an instrumental NP, the same one as the one used for the agentive phrase with passives, (2).

- (2) *Gorod byl razruš-en vrag-om.*  
 city be<sub>PST.M.SG</sub> destroy<sub>PPP</sub> enemy<sub>INSTR.SG</sub>  
 "The city was destroyed by the enemy."

The genitive and instrumental NPs in (1b) are assumed to be direct heirs of the verbal arguments (Giorgi & Longobardi 1990, see also criticism of this account in Rozwadowska 2000). A transitive verb can nominalize only after an obligatory passivization, which promotes the internal argument to the subject position and demotes the subject to an adjunct position, so that it can be expressed by means of an instrumental NP. After this is done, nominalization of a structure like that in (2) doesn't differ from nominalization of an intransitive verb with an instrumental adjunct, as in (3). Namely, the former subject of an intransitive verb becomes genitive or possessive, and the *by*-phrase is kept intact.

- (3) a. *Malčik priexa-l poezd-om.*  
 boy arrive<sub>PST.M.SG</sub> train<sub>INSTR.SG</sub>  
 "The boy arrived by train."  
 b. *priezd malčik-a poezd-om*  
 arrival boy<sub>GEN.SG</sub> train<sub>INSTR.SG</sub>  
 "the boy's arrival by train"

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aspectual modifier *-yva-*, like *razbi-va-nie* 'breaking', and subordinate some types of adjuncts, see (6) below for a purpose one.

Possible support for this hypothesis is provided by the fact that in the majority of Slavic languages the most common suffix of nominalization can be analyzed as including a passive participle (PPP) morpheme (Babby 1997, Rappoport 2001). For Russian, e.g., verbal nominalizer *-nij/-tij* can be decomposed into a passive participle morpheme *-n-/-t-*, with even the same distribution between *-n-* and *-t-* and the same vowel alternations, (4ab), and an adjectival nominalizer *-ij-*, (5):<sup>3</sup>

- (4) a. *zakry-t* ‘to close’ — *zakry-t* ‘closed’ — *zakry-t-ij-e* ‘closing’  
 close<sub>INF</sub>                      close<sub>PPP</sub>                      close<sub>PPP-N-NOM</sub>
- b. *razruši-t* ‘to destroy’ — *razruš-en* ‘destroyed’ —  
 destroy<sub>INF</sub>                      destroy<sub>PPP</sub>  
*razruš-en-ij-e* ‘destruction’  
 destroy<sub>PPP-N-NOM</sub>
- (5) *velik* ‘great (predicative short form)’ — *velič-ij-e* ‘greatness’  
 great    great<sub>N-NOM</sub>

Given these facts, the derivation of deverbal nominals seems straightforward: a whole *vP* attaches first the PPP morpheme to its *v* head, which triggers movement of the object to the subject position, and then the whole structure nominalizes.

However, as was pointed out in Tatevosov & Pazelskaya (2003), Pazelskaya & Tatevosov (2006), this analysis encounters one serious problem: PPPs are stative, whereas most of the deverbal nouns tend to keep the whole aspectual structure of the initial verbs intact. Indeed, *destruction* denotes a telic process, while *destroyed* refers only to the resultant state.

### 2.3. Deficient *vP* hypothesis

There are some facts that argue for the presence of a certain kind of *vP* projection in nominalizations in Russian. As is shown in Pazelskaya & Tatevosov (2005), deverbal nouns can subordinate purpose adjuncts, (6), and attach agent-oriented adverbials, (7).<sup>4</sup>

3 For the sake of simplicity, in the following text I will not decompose nominalizer *-nie/tie* into *-n/t-* (glossed as PPP) and *-ij* (glossed as N) and will gloss it as a whole as NMN.

4 The same arguments hold for nominalizations in other languages: see Alexiadou (2001) on English and Modern Greek, Fu, Roeper & Borer (2001), Roeper (2004) on English.

- (6) *napisa-ni-e pis-em v prokuraturu*  
 write<sub>NMN-NOM</sub> letter<sub>GEN.PL</sub> to Prosecutor's Office  
*s celju vyjasnenija dostovernosti ekspertizy*  
 with goal verifying reliability expertise  
 "writing letters to the Prosecutor's Office in order to verify the reliability  
 of the expertise"
- (7) *nanes-eni-e sebe umyšlenno telesn-yx povrežden-ij*  
 cause<sub>NMN-NOM</sub> oneself<sub>DAT</sub> deliberately bodily<sub>GEN.PL</sub> injury<sub>GEN.PL</sub>  
 "causing injuries to oneself deliberately"

Moreover, the subject position in deverbal nominals can be controlled by the subject of a higher verb (usually of a phrase or a light verb):

- (8) *Vrag načal razruš-eni-e gorod-a (\*protivnik-om).*  
 enemy begin<sub>PST.M.SG</sub> destroy<sub>NMN-ACC.SG</sub> city<sub>GEN.SG</sub> adversary<sub>INSTR.SG</sub>  
 "The enemy began the destruction of the city (\*by the adversary)."

All these properties of Russian deverbal nominals support the point that nominalization should at least be able to inherit the agentive argument and the vP projection from the verbal stem. As for the optionality of the agentive argument and its incapacity to assign case, it has been proposed that the vP in nominalizations is deficient (Alexiadou 2001). It cannot host a DP, and the English *by*-phrase and Russian instrumental NP are adjuncts, however, they can saturate the semantic agentive role. It can be saturated via control as well, as in (8), and otherwise it gets existentially bound.

### 3. Data

Now let us turn to the data of Russian nominalizations. Transitive predicates in Russian, like *razrušit' (gorod)* 'to destroy (a city)', *podmetat' (pol)* 'sweep (the floor)', *splesti (niti)* 'to interlace threads' can form three types of deverbal nominals, with respect to their argument properties: nominals which can be both transitive and intransitive (referred to as transitive-&-intransitive nominals), nominals which can be only transitive, i.e. denote only causative situation, and nominals which can be only intransitive.

#### 3.1. Transitive-&-intransitive nominals

In the absence of an explicit agentive NP, nominals of this kind are ambiguous between transitive (9i) and intransitive (9ii) meanings. Traditional Russian

grammars and dictionaries often put it as if the nominalization correspond to both the transitive verb (as the one in (1a)) and to its decausative derivative with reflexive morpheme *-sja*, (10), — see, e.g. Shvedova (1980).

- (9) *razruš-eni-e gorod-a* “destruction of the city”  
 destroy<sub>NMN-NOM</sub> city<sub>GEN.SG</sub>  
 = i. The fact that someone destroyed the city (transitive).<sup>5</sup>  
 ii. The fact that the city collapsed without a special cause/for some unknown reason (intransitive decausative).

- (10) *Gorod razruš-il-sja.*  
 city destroy<sub>PST.M.SG-REFL</sub>  
 “The city collapsed (without a special cause/for some unknown reason).”

Deverbal nouns with decausative meaning are therefore assumed to have, somewhere in their structure, a covert reflexive morpheme identical to the verbal *-sja*. However, this assumption not only violates the principle of monotonicity of derivation, but makes a strong prediction that there has to be a one-to-one correspondence between the verbal stems that allow for *-sja*-decausativization and those that form nominals with both transitive and intransitive meanings, which is not the case, as we will see.

Some other examples of ambiguous nominals: *razbivanie* ‘breaking’, *otkryvanie* ‘opening’, *uveličenie* ‘increase’, *oprokidyvanie* ‘upsetting’.

### 3.2. Transitive-only nominals

Some Russian transitive verbs form nominals with only transitive, causative meanings, and don’t allow for decausativization:

- (11) *podmeta-ni-e pol-a* “sweeping (of) the floor”  
 sweep<sub>NMN-NOM</sub> floor<sub>GEN.SG</sub>  
 = i. The fact that someone swept the floor (transitive).  
 ii. \*The fact that the floor was swept by itself/for some unknown reason (intransitive).

5 Russian deverbal nominals, as it is common for deverbal nominals in general, can denote not only facts, but also events and propositions, depending on the context (see Lees 1960, Vendler 1968, 1979, Zucchi 1993, Peterson 1997, among many others). Here we ignore these differences and give only factive translations.

The same behaviour is shown, for example, by deverbal nouns *vytiranie* ‘wiping’, *sverlenie* ‘boring’, *vešanie (pal'to)* ‘hanging (a coat)’, *gašenje (ognja)* ‘extinguishing (the fire)’.

Most of the verbal stems that form nominals of this class don’t allow for decausativization with *-sja* in their verbal guise, (12), but some still do, as in (13).

- (12) \**Pol podme-l-sja.*  
 floor sweep<sub>PST.M.SG-REFL</sub>  
 Int: “The floor got swept (by itself/for some unknown reason).”

- (13) <sup>OK</sup> *Ogon' gas-it-sja.*  
 fire extinguish<sub>PRS.3.SG-REFL</sub>  
 “The fire gets extinguished (by itself/for some unknown reason).”

Verbal stems of the second kind, which allow for *-sja*-decausativization but cannot form decausative nominalizations, present the most striking kind of counterexamples for the prediction of direct correspondence between decausative verbs with *-sja* and deverbal nominals with decausative meaning. Indeed, if all the decausative nominals directly derive from *-sja*-verbs, absence of decausative meaning of nominal *gašenje* ‘extinguishing’ is inexplicable, given (13).

### 3.3. Intransitive-only nominals

The third class of nominalizations of transitive verbs is presented by the nominals that are subject to obligatory decausativization and therefore only have intransitive meaning:

- (14) *splete-ni-e nit-ej* ‘interlacement of threads’  
 interlace<sub>NMN-NOM</sub> thread<sub>GEN.PL</sub>  
 = i. \*The fact that someone interlaced the threads (transitive).  
 ii. The fact that the threads are interlaced (intransitive).

These nominals have two distinctive features: they cannot attach agentive instrumental NPs, (15), and are stative, as the incompatibility with adjective *postepennyj* ‘gradual’ shows, (16). In fact, these nouns denote the stative result of the situation – the resultant state, attained by the patient argument.

- (15) \**splete-ni-e nit-ej vyšival'ščic-ej*  
 interlace<sub>NMN-NOM</sub> thread<sub>GEN.PL</sub> embroideress<sub>INSTR.SG</sub>  
 Int.: “interlacement of threads by the embroideress”

- (16) \**postepennoe splete-ni-e nit-ej*  
 gradual interlace<sub>NMN-NOM</sub> thread<sub>GEN.PL</sub>  
 Int.: “gradual interlacement of threads”

Some more examples of nominals of this kind: *obledenenie* ‘ice covering’, *skreščenie* ‘crossing’, *izumlenie* ‘amazement’, *vosxiščenie* ‘admiration’.

#### 4. Analysis

Since intransitive-only nominals differ strikingly from the other two types of Russian deverbal nominals, we will first discuss the differences between transitive-only nominals and transitive-&-intransitive nominals, and then proceed to the nominals with only intransitive meaning.

##### 4.1. Transitive-&-intransitive nominals vs. transitive-only nominals

The goal of this section is to identify what properties a verbal stem should have in order to form a nominal with a possible decausative meaning and therefore to belong to the first class of nominals, and vice versa, what prevents nominals of the second type from decausativization.

Nominals that can be both transitive and intransitive show something very close to the causative-inchoative alternation observed, e.g., with many verbs in English (Borer 1991, Hale & Keyser 1993, Reinhart 2002), cf. (17ab).

- (17) a. *John opened the door.*  
 b. *The door opened.*

In Russian, as we have seen above in 3.1., there are almost no verbs with alternating transitivity, and decausatives are formed with a special morpheme – *sja*, (10). But *-sja*-decausativization in Russian verbs shares with the transitivity alternation in English verbs one fundamental precondition: in order to allow for the agent to be eliminated, the verbal meaning should not contain any agentive components (cf. e.g. Hale & Keyser 1993 for English, Paducheva 2001 for Russian, and Haspelmath 1987, 1993 for a typological account). This precondition seems quite reasonable: if the verbal meaning says something precise about how the Agent performs the action described, the Agent cannot be eliminated.

This precondition can be easily formulated in terms of Rappaport Hovav & Levin’s (1998) distinction of “result” vs. “manner” verbs. This account proposes lexical decomposition of predicates along the lines introduced in the classical work by Dowty (1979) and argues that verbal meanings can be represented as a combination of a primitive predicate which is taken from a

restricted set of five possible structures, roughly corresponding to Vendler's actional types, and a lexical constant, i.e., the non-structured part of meaning that differentiates verbs of the same structural type (e.g., *eat* from *drink*).

Transitive dynamic verbs can be of two structural types, as in (18), where the words in capital letters are the names of the predicates the verb meaning is decomposed into, and the italicized words in angle brackets indicate places for the lexical constants.

- (18) a. [x ACT<sub><MANNER></sub>]  
 b. [x ACT] CAUSE [BECOME [y <STATE>]]

(18a) represents atelic processes, like *run* or *sweep*; though the structural formula contains only one variable, the verb can have two arguments, the second one provided by the lexical constant. Verbs of the type in (18b) are telic processes, like *break*, *open* and *dry*.

The crucial thing that affects argument properties of the verb is the place of the lexical constant, which determines what this verb is about, what is the key argument of the situation. If the constant describes the activity of the first argument *x*, (18a), then it is impossible to get rid of this argument when the verb is used, but the direct object can be absent (like in *run*) or omitted (like in *sweep*). Verbs describing the manner the Agent performs the action in are called manner verbs. But if it is the state of the second argument *y* that the verb describes, as in (18b), then the verb cannot go without this argument, but allows for a use without the first one (cf. English *open*). Such verbs are called result verbs.

A natural prediction follows, that as soon as all the telic verbs specify the result of the action and all the atelic ones are about manner, then all the telic verbs should allow for decausativization, and all the atelic ones should not. This is, therefore, not the case, the reason being that, as it has been independently shown recently (see below), there are ways of building a verb that specifies both resultant state of the internal argument and activity of the external argument, (19).

- (19) [x ACT<sub><MANNER></sub>] CAUSE [BECOME [y <STATE>]]

There is a growing body of evidence that at least some verbal modifiers like Slavic or German prefixes or English phrasal verb particles add to the meaning of the whole verb exactly the resultant state attained by the internal argument (see e.g. Svenonius 2003, 2004, Ramchand 2004, Romanova 2004, Pazelskaya & Tatevosov 2006). Therefore, if the verbal stem itself is of the type (18a) and if it provides the <MANNER> constant, together with the <STATE>

constant introduced by the particle *it* will give exactly the template in (19).<sup>6</sup> An example of a Russian verb of this type, *vpisat'* 'to write, to insert into', is given in (20a), and its representation in (20b).

- (20) a. *Mal'čik v-pisa-l \*(dat-u) v pis'm-o.*  
 boy<sub>NOM.SG</sub> IN write<sub>PST.M.SG</sub> date<sub>ACC.SG</sub> into letter<sub>ACC.SG</sub>  
 "The boy inserted the date into the letter."  
 b. [x ACT<WRITE>] CAUSE [BECOME [y <INSIDE z>]]

The presence of the <STATE> specifier in (20a) is proved by the fact that it is no longer possible to omit the direct object *datu* 'date<sub>ACC</sub>'.

As soon as the <MANNER> component is also present in verbs like those in (19), they don't allow decausativization, see (21).<sup>7</sup>

- (21) \**Dat-a v-pisa-l -a-s' v pis'm-o.*  
 date<sub>NOM.SG</sub> IN write<sub>PST-F-REFL</sub> into letter<sub>ACC</sub>  
 Int. "The date got inserted into the letter by itself / for some reason."

Decausativization in deverbal nominals also obeys this rule: all the verbal stems that specify the activity of the Agent belong to types (18a) and (19), and form nominals with only transitive meanings: *podmetanie* 'sweeping', *vpisanie* 'inserting, writing into'.

However, it is not the case that all the stems without <MANNER> component derive transitive-&-intransitive nominals: if it were, then the verbs that allow for *-sja*-decausativization would be exactly the same that form ambiguous nominals. We have seen above, in section 3.2, that there are verbs like *gasit'* 'extinguish', which allow for *-sja*-decausativization (13), but form deverbal nouns with only causative meaning. Other examples of the same kind are *vešanie* 'hanging', *voskrešenie* 'resurrection (trans.)', *sažanie* 'seating (trans.)'. All the basic verbs are morphologically derived causatives from intransitive verbs either with the suffix *-i-* (*gasit'* 'extinguish' from *gasnut'* 'get extinguished, go out', *voskresit'* 'resurrect (trans.)' from *voskresat'* 'resurrect

6 The exact mechanism of this derivation is beyond the scope of this paper, some proposals can be found in the cited literature.

7 It is important to note here that not all the prefixed verbs are organized compositionally, i.e. can be easily decomposed into the prefix meaning and the one of the non-prefixed stem. As it seems, one of the issues of non-compositionality is the removal of the <MANNER> constant. E.g., Russian *raz-bit'* 'to break' morphologically can be analyzed as *raz-* 'dis-, apart' and *bit'* 'to beat', but the whole prefixed verb doesn't necessarily mean that the broken object has been disassembled, crashed or destroyed by beating: it could be, e.g., an accidental push, falling down, throwing against a wall etc. That's why this verbal stem behaves like one of the type in (18b), not in (19).

(intrans.)) or with *-a-* (*vešat* ‘hang (trans.)’ from *viset* ‘hang (intrans.)’, *sažat* ‘seat’ from *sidet* ‘sit’), sometimes with some accompanying morpho-phonological changes.

The conclusion that can account for these differences in behaviour between verbs and deverbal nominals is that in Russian decausativization in nominals, unlike decausativization in verbs, is obligatorily blocked by explicit causative morphemes. The reason why the same stems used as verbs allow for *-sja-*decausativization is that nominal decausativization is unmarked, and therefore is blocked by causative markers, while the verbal one is not and for this reason obeys only semantic restrictions.<sup>8</sup>

#### 4.2. Intransitive-only nominals

Let us now turn to the nominals which derive from transitive verbs but are nevertheless intransitive. As has already been observed in 3.3, together with the agentive argument they lose the dynamic part of the situation and are able to denote only the resultant state of the internal argument.

Semantic and syntactic transformations which a verbal stem undergoes in these nominals are quite close to those that had been argued to occur in German passive participles by Kratzer (2000). In order to account for them, she introduces a special operator, Stativizer, imposed by the PPP morpheme and having the following semantics:

$$(22) \|\text{STAT}\| = \lambda R \lambda s \exists e R(s)(e)$$

The Stativizer applies to two-stage situations containing a dynamic and a resultant stative stage and existentially closes the dynamic stage of the event and returns the resultant state.

Along the lines of numerous suggestions about the tight link between elements of aspectual structure and actants of the predicate (besides the above cited approaches, see also Grimshaw 1990, Ramchand 2002, 2003), one can

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8 There seems to be one more class of verbal stems that allow for the verbal *-sja-*decausativization, but not for the unmarked nominal one, and don't have explicit causative morphemes. E.g., these are verbs like *pro-lit* ‘out-pour’ (<sup>OK</sup>*prolit'sja* ‘pour out by itself’, but the derived nouns *prolitie/prolivanie* denote only the causative situation, ‘the fact that someone outpoured something’, not ‘the fact that something outpoured by itself’). A possible way to deal with these cases is to allow for the irremovable causative component to be implicit. The thing that distinguishes verbs like *prolit* from verbs like *vpisat* is the presence of an intransitive counterpart in the lexicon: for *prolit* there is *proteč* ‘to leak, to flow’, while for *vpisat* it is impossible to find one.

regard the loss of the Agentive argument as a mere consequence of the loss of the whole dynamic stage that the Agentive argument is responsible for.

The conditions on forming nouns of this type are not clear; the two observable facts are that such nouns are not numerous and regular and that many of them are names of emotional states, derived from the verbs that describe causation of these states, like *izumlenie* ‘amazement’ from *izumljat* ‘amaze’, *vosxiščenie* ‘admiration, delight’ from *vosxiščat* ‘to delight’ or *ogorčenie* ‘distress’ from *ogorčat* ‘to distress’ (Pazelskaya 2005). Given all this, we assume for the moment that nominals of this kind are formed in the vocabulary, by an unproductive derivational process, close to the one that forms perfective participles.

Intransitive stative nouns derived from transitive dynamic verbs can be viewed as a special kind of result nominals, like the English *building* ‘edifice’ from *build* (see Chomsky 1970, Grimshaw 1990 for the distinction between event and result nominals). The only difference is that the result of the situation is of a more virtual kind: it is not a physical object, but some emotional state or spatial configuration of the object(s) denoted by its argument.

This only difference between the types of result is, however, important in explaining the peculiarities of the nouns of this type. The authors who oppose the claim that stative deverbal nominals, and especially so-called “psych”-nominals, are result ones (e.g. Pesetsky 1995, Rozwadowska 2000) share the presupposition that result nominals and situation nominals are two nonintersective classes. They demonstrate that these nominals are situational, that is, they can on the one hand have their own arguments, temporal adjuncts, etc., and on the other hand they cannot pluralize. And this leads the researchers to a conclusion that these nominals are not result ones.

My point here is that these are two different properties, and one and the same nominal can be result and situational at the same time, and the intransitive-only nominals are exactly the case. The term “result nominal” in general doesn’t tell anything about the properties of the noun, it refers only to its relation to the situation denoted by the corresponding verb. It is the verb that defines what the noun will be like and what sort of entity it will refer to, will it be a physical object, a situation, or a property, it depends on what sort of entity is brought to existence during the situation described by the verb. Our presuppositions that the results are physical objects, are induced by the statistical prevalence of the verbs of physical object creation, not by the nature of the operation of Stativization.

## 5. Conclusions

Now we are in the position to evaluate the three possible solutions for the problem of inheritance of verbal arguments in deverbal nominals, described in

section 2. The discussion above shows that all the three hypotheses, External Argument Suppression Hypothesis, Passivization Hypothesis and Deficient *v*P Hypothesis, hold, but for different cases.

The Deficient *v*P Hypothesis is the case of transitive-only nominals, as well as of the transitive interpretations of transitive-&-intransitive nominals. These nominals show exactly the properties predicted by this hypothesis, i.e., they preserve agentive properties of the initial verbal stem with existential binding of the external argument, the reduction of its referentiality and elimination of case-assigning properties.

The External Argument Suppression Hypothesis, where the External argument position within deverbal nominals either does not emerge at all, or is suppressed in the process of nominalization, is the case of the intransitive interpretation of transitive-&-intransitive nominals.

Intransitive-only nominals with the result-stative meaning follow the Passivization Hypothesis; the external argument is not only structurally demoted, but completely eliminated together with the dynamic part of the situation.

Despite the formal similarities, all the deverbal nominals in Russian aren't derived from passive participles (as was claimed in Babby 1997): it can be so solely for intransitive-only nominals. For other types of derived nominals it is impossible to explain the re-emergence in nominals of the external argument and the eventive part of meaning, deleted by the Stativizer or other analogous passivizing operator.

These conclusions evoke an important question about how these three analyses are mutually compatible, and how the mechanisms suggested by them interplay. Actually they are distributed according to the rules described above and therefore do not conflict. The Passivization Hypothesis applies only in the lexicon and to a limited number of verbal stems defined lexically. As for the distribution among the External Argument Suppression Hypothesis and the Deficient *v*P Hypothesis, these are the lexical properties of the verbs formulated above in terms of event-structure templates that decide if the external argument can be suppressed from the structure, or not.

To conclude, it is worth saying that the main two language mechanisms which determine the argument realization in Russian deverbal nominals are the grammar-lexicon opposition and the event type distinction, i.e., if the verbal stem denotes an event with an Agent-oriented <MANNER> component, or without it.

## **6. Consequences**

Here are some consequences that can be drawn from the discussion above. For Russian, argument properties of derived nouns provide an answer to a broadly

asked question whether all these argument structure changing operations apply in the lexicon/dictionary (cf. Reinhart & Siloni 2005, Siloni 2005, Siloni & Preminger 2006). The answer is as follows. On the one hand, passivization (applying Stative and deriving intransitive stative nominals from transitive dynamic verbs) is a clearly lexical process, because of its low productivity and irregularity. On the other hand, decausativization is a syntactic realization of the possibilities already defined by the lexicon, that is, a noun can have an intransitive meaning if the lexical semantics of the stem favours it. Decausativization is syntactic, and not lexical, since if it were, it would be possible to find intransitive-only nominals with dynamic decausative, not stative passive meaning, with decausativization having happened in the lexicon.

The issues discussed here are of some importance for other Slavic and non-Slavic languages, as well. The fact that the behaviour in Russian deverbal nominals is close to what is attested for verbs in e.g. English, with even the same preconditions, implies that hypothetical “bare” verbal predicates in Russian have the same potential for transitive and intransitive uses, but in verbs the intransitive use is blocked by the verbal morphology, and a special decausativizing morpheme *-sja* is needed to saturate the argument. It is appropriate here to recall the problem of indirect access (Zucchi 1999, Kratzer 2003):

In analyzing the meaning of temporal and aspectual features, we make assumptions about the truth conditions of uninflected clauses like 'Carnap fly to the moon', 'Terry build a house' and 'Terry be at home'. However, we have only indirect evidence of how these sentences are interpreted by native speakers, since they do not occur as independent clauses in English. (Zucchi 1999: 180)

Russian deverbal nouns suggest that the causative/inchoative alternation can be a more wide-spread cross-linguistic phenomenon than it has been assumed, but in some languages morphological factors can intervene and prevent us from noticing it<sup>9</sup>. What exactly can be a blocker for the unmarked intransitive use of a verbal stem is subject to cross-linguistic variation.

In Czech (Hron 2005), where the intransitive use of nominalizations of transitive stems is obligatorily marked, the nominal morphology is also a blocker for intransitive use without saturation of the argument—possibly depending on some aspectual/actional factors (Dvořáková-Prochazkova 2006).

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9 The fact that Russian deverbal nominals differ, for the same reason, in their aspectual behaviour from Russian verbs has been independently substantiated in Pazelskaya & Tatevosov (2006).

In Slovenian, as the data provided by an FDSL 6,5 reviewer suggest, blocking of the decausative meaning depends on the syntactic status of the argument expression, whether it is a clitic or an argument NP.

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## Revisiting Involuntary State Constructions in Slovenian\*

### 1. Introduction

In this paper, we address three questions concerning Slovenian (Slo) sentences such as (1), dubbed Involuntary State Constructions (ISCs) from now on.

- (1) *Janezu se spi.*  
 J<sub>DAT</sub> Refl sleep<sub>PRES.3S</sub>  
 “John {is sleepy / feels like} sleeping.”

The first question (Q1) triggered by a recent debate is whether the syntax of ISCs consists of one clause with one V (Rivero & Sheppard (R&S) 2003, Rivero 2003, 2004, 2005b, a. o.), or two clauses with two Vs (Marušič & Žaucer (M&Ž) 2004, 2006). We argue in favor of a structure with one V with the rough characteristics in (2), and against a structure with two Vs with the rough characteristics in (3) (the reader is referred to the cited references for details).

- (2) [<sub>AppP</sub> NP<sub>DAT</sub> [<sub>App'</sub> App [<sub>TP</sub> Tense [<sub>AspP</sub> Aspect <sub>vp</sub>[<sub>v</sub> VP]]]]].

- (3) [<sub>TP</sub> NP<sub>DAT</sub> [<sub>VP1</sub> [<sub>V1</sub> FEEL-LIKE ... [<sub>VP2</sub> ... [<sub>V2</sub> ]]]]].

The second question (Q2) concerns intensionality/modality in ISCs, which lack clear intensional markers. Following Rivero (2005), we argue that modality in the ISC in (2) resides in an Operator **Asp<sup>Op</sup>** in an Aspect slot associated with Viewpoint Aspect in the sense of Smith (1991). The last question (Q3) is whether ISCs should be unified with Inchoatives with dative involuntary agents such as (4) (see Kallulli 1999, 2006 on Albanian (Alb)). We argue that ISCs and Inchoatives differ, precluding a unified analysis for the two constructions in UG.

- (4) *Janezu so se z-lomila očala.*  
 J<sub>DAT</sub> be<sub>3PL</sub> Refl PF-broken<sub>PL</sub> glasses<sub>NOM.PL</sub>  
 “John broke the (seeing) glasses involuntarily.”

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\* Research partially subsidized by SSHRC Grant 410-2006-0150 to M. Rivero. We thank Dalina Kallulli and Rok Žaucer for comments on an earlier version, and past discussions. Special thanks to Janez Orešnik for insightful suggestions mentioned only in part for lack of space. Errors are our own.

In sum, ISCs have a monoclausal structure with Asp<sup>Op</sup> for modality, and differ from Inchoatives with datives. In §2, we introduce morphology in ISCs, in §3 we address Q1 and Q2, and in §4 we answer Q3.

## 2. Introducing Involuntary State Constructions

Alb, Slo, and South Slavic languages share ISCs with similar syntax and semantics. Let us introduce them, with languages other than Slo and English indicated. Intransitive ISCs contain dative logical subjects and default Vs (3S, Neuter) known as unergative – (1) and (5a-b), or as unaccusative – (6a-c), a distinction important in §4. Slavic ISCs must contain clitic *se*, and Alb ISCs a nonactive voice marker, such as clitic *u* in (5b), and suffix *-het* in (6c).

- (5) a. *Na decata im se raboteše.* Bul(garian)  
 P children.the 3<sub>PL.DAT</sub> Refl work<sub>IMP.3S</sub>  
 “The children felt like working.”
- b. *Benit i u punua.* Alb  
 B<sub>DAT</sub> 3<sub>S.DAT</sub> NAct work<sub>3S</sub>  
 “Ben felt like working.”
- (6) a. *Janezu se je umiralo doma.*  
 J<sub>DAT</sub> Refl be<sub>3S</sub> die<sub>NEU</sub> at.home  
 “John felt like dying at home.”
- b. *Na men mi se živee.* Bul  
 P 1<sub>S</sub> 1<sub>S.DAT</sub> Refl live<sub>3S</sub>  
 “I feel like living.”
- c. *Anës i jeto het në Austri.* Alb  
 A<sub>DAT</sub> 3<sub>S.DAT</sub> live<sub>NACT.PRES.3S</sub> in Austria  
 “Ann feels like living in Austria.”

Transitive ISCs contain an additional nominative logical object in agreement with V, as in (7-9).

- (7) *Janezu se je pila voda.*  
 J<sub>DAT</sub> Refl be<sub>3S</sub> drunk<sub>FEM.S</sub> water<sub>FEM.S.NOM</sub>  
 “John felt like drinking water.”
- (8) *Na Ivan mu se četjaxa knigi.* Bul  
 P Ivan 3<sub>S.DAT</sub> Refl read<sub>IMP.3PL</sub> book<sub>PL.NOM</sub>  
 “John felt like reading books.”

- (9) *Anēs i lexo-hen /\*-het dy libra.* Alb  
 A<sub>DAT</sub> 3<sub>S.DAT</sub> read<sub>NACT.PRES.3PL/\*3S</sub> two book<sub>PL.NOM</sub>  
 “Ann feels like reading two books.”

Slo has a pattern for transitive Vs in ISCs absent in other languages, which is important in §4: a default V and an accusative logical object, as in (10).

- (10) a. *Janezu se je pilo vodo.*  
 J<sub>DAT</sub> Refl be<sub>3S</sub> drunk<sub>NEU</sub> water<sub>FEM.ACC</sub>  
 “John felt like drinking water.”
- b. *Janezu se piše pisma.*  
 J<sub>DAT</sub> Refl write<sub>3S</sub> letter<sub>PL.ACC</sub>  
 “John feels like writing (the) letters.”
- c. *Janezu se na vrtu umiva sebe, ne pa dojenčka*  
 J<sub>DAT</sub> Refl on garden wash<sub>3S</sub> himself<sub>ACC</sub> not baby<sub>ACC</sub>  
 “John feels like washing himself in the garden, not the baby.”

### 3. Aspect as Modal Operator in ISCs: Answering Q1 and Q2

Let us now examine Aspect in ISCs, which we propose is the source of their modal reading for several reasons. In §3.1, we identify syntactic and semantic similarities between ISCs and modal Progressives in English, which we attribute to Aspect. In §3.2, we compare Slo and Bul and conclude that their ISCs show morphosyntactic variation, but always contain an aspectual operator for modality. In §3.3, we note formal differences between ISCs and Psych constructions, rejecting (3) and adding support to (2).

#### 3.1. Modifiers in modal aspectual contexts

Adverbs (Adv<sub>s</sub>) and Depictive Adjectives (Adj<sub>s</sub>) that should be in conflict but in fact are not behave similarly in ISCs and English sentences that Copley (2002) calls “Futurate Progressives”, i.e. with a modal Progressive as in (Dowty 1979). We attribute such a parallelism to a modal aspectual operator dubbed Asp<sup>Op</sup> in ISCs such as (2). To motivate this idea, we begin with the ISC with two Time Adv<sub>s</sub> in (11).

- (11) *Zdajle se mi ne gre jutri domov.*  
 now Refl 1<sub>S.DAT</sub> Neg go<sub>OPRES.3S</sub> tomorrow home  
 “Right now, I do not feel like going home tomorrow.” (M&Ž)

For M&Ž, (11) supports main and subordinate lexical Vs in ISCs, as in (3). By contrast, we consider (11) monoclausal, (2), with the first Adv taking scope over the aspectual operator, and the second under its scope. Note that English constructions with a modal Progressive such as (12a-b) allow the same type of modification as (11), which we attribute to similar aspectual operators in the two cases. For Rivero (2005b), Spanish sentences with a modal Imperfect (Cipria and Roberts 2000) can contain two apparently conflicting Time Advs as well.

- (12) a. *Yesterday morning I was leaving tomorrow on the Midnight Special.* (Dowty 1979)  
 b. *For two weeks, the Red Sox were playing the Yankees today.* (Copley 2002)

A characteristic of such modal patterns is that the first Adv must modify the feeling / plan, and the second the (intended) event described by V. The Manner Advs in (13) and (14) fit the same generalization. To repeat, if ISCs consist of one clause with Asp<sup>Op</sup>, the parallelism with English is expected.

- (13) *Ani se je skrivoma plesalo vsem na očeh.*  
 A<sub>DAT</sub> Repl be<sub>3S</sub> secretly danced<sub>NEU</sub> to.everybody on eyes  
 “Ana secretly felt like dancing in plain view.”

- (14) *Nomar is secretly practicing in plain view tomorrow.* (Copley 2002)

The ISC in (13) is similar to English (14) in so far as Ana’s feeling about dancing in plain view and Nomar’s plan to practice in plain view are asserted to be secret respectively. Thus, Manner Advs can combine in ISCs without contradiction, mimicking Adv in English Progressives (for M&Ž, the dispositional segment of ISCs does not tolerate Manner Advs, which seems contrary to fact).

Other combinations of modifiers, which at first sight should conflict but do not, share the noted properties. ISCs parallel English Progressive sentences in so far as the first modifier composes semantically with the urge/ feeling, and the second with the intended event. This is seen with double Degree Adv in (15a), and Depictives in (15b) parallel to English (15c), sentences that for M&Ž support a two-V hypothesis as in (3).

- (15) a. *Zelo se mi je malo tarnalo.*  
 very Repl I<sub>DAT</sub> be<sub>3S</sub> little whined  
 “I very much felt like whining a little.” (M&Ž)

- b. *Jušu se treznemu ni kuhalo pijan.*  
 J<sub>DAT</sub> Refl sober<sub>DAT</sub> Neg cooked drunk<sub>NOM</sub>  
 “Jush, (all) sober, didn't feel like cooking drunk.” (M&Ž)
- c. *Nomar now all sober is not cooking completely drunk tomorrow.*

In such modal contexts, modifier order indicates semantic scope, so switching Time Adverbs in (11) and (12a-b) results in contradictions: (16a-b).

- (16) a. \**Tomorrow I was leaving yesterday on the Midnight Special.*  
 b. \**Jutri se mi ne gre zdajle domov.*  
 tomorrow Refl 1<sub>S.DAT</sub> Neg go<sub>PRES.3S</sub> now home  
 “\*Tomorrow, I do not feel like going home now.”

Switching order with Manner Advs and Depictives results in different truth conditions. Copley (2002) tells us that *Nomar is cleverly practicing stupidly tomorrow* refers to a clever plan. We add that *Nomar is stupidly practicing cleverly tomorrow* refers to a stupid plan, and parallel ISCs could be constructed in Slo. Depictives in (15b-c) contrast with (17a-b), with the feeling/plan assigned to a sober individual in the first, and a drunk one in the second.<sup>1</sup>

- (17) a. *Jušu se pijanemu ni kuhalo trezen.*  
 J<sub>DAT</sub> Refl drunk<sub>DAT</sub> Neg.be<sub>3S</sub> cooked sober<sub>NOM</sub>  
 “Jush, drunk, did not feel like cooking sober.”
- b. *Nomar now all drunk is not cooking completely sober tomorrow.*

The two possible locations for *spet* “again” and *pogosto* “often” in (18a-b) noted by M&Ž also illustrate semantic scope encoded in order, with the first Adv outside the scope of the modal operator, as in the above sentences.

1 In ISCs with two depictives, the first must be dative and the second nominative. J. Orešnik suggests that the first composes with the dative NP, and the second with (nominative) *se*, mirroring their cases. If depictives bear a local relation to the items they agree/concord with, in (17a), the first must be locally c-commanded by the Applicative, and the second by the item nominative *se* stands for: i.e. the external argument variable of V in VP as in (R&S 2003). Intervention, then, prevents a second depictive from agreeing with the dative; intuitively, *se* stands in the c-command path between dative and second depictive, with \*NOM-DAT depictives deviant. Thus, DAT-NOM depictives are on a par with Adv scope, and \*NOM-DAT depictives on a par with deviant Adv sequences of type (16a-b).

- (18) a. *Bobanu se spet pogosto kadi havanke.*  
 B<sub>DAT</sub> Refl again often smokes Havanas  
 “Boban again often feels like smoking Cuban cigars.” (M&Ž)
- b. *Bobanu se pogosto spet kadi havanke.*  
 B<sub>DAT</sub> Refl often again smokes Havanas  
 “Boban often feels like smoking Cuban cigars again.” (M&Ž)

To sum up, modality in ISCs and English Progressives is similar, which can be captured via aspectual operators in a modal role in both constructions.

Before concluding §3.1<sup>2</sup>, we mention a concrete way to capture the syntactic / semantic behavior of double modifiers in monoclausal modal contexts. Maienborn (2001) argues that there are three sites within a clause where modifiers of the same type can be merged: (a) **Internal** in the V-periphery, (b) **External** in the VP-periphery, and (c) **Frame-setting** in the C-domain (also (Tenny 2000) on different classes of Advs, a. o.). If we apply Maienborn’s views to ISCs with conflicting Advs / Adjs such as the above, it can be proposed that they contain a **Frame-setting** Adv/Adj modifying the High Applicative in (2), and an **External** Adv modifying the VP. Frame-setting Advs are not in the scope of Asp<sup>Op</sup>, so not in the portion of the clause treated as a modal context in semantics; by contrast, External Adverbs are within the scope of Asp<sup>Op</sup> (more details in Rivero 2005b).<sup>3</sup>

- 2 Kallulli (p.c.) mentions that Alb ISCs differ from control structures in disallowing partial control (i.e. equivalents of *John felt like meeting together* are \*). Slo lacks partial control (Golden 2003), with this argument inapplicable. Slo ISCs differ from control structures in allowing possessive anaphors and possessive pronouns, (i.a); the latter are not allowed in control structures, (i.b).

- (i) a. *Janezu<sub>j</sub> se jé jagode v svoji/njegovi<sub>j</sub> sobi.*  
 J<sub>DAT</sub> Refl eat<sub>3S</sub> strawberries<sub>ACC</sub> in his<sub>ANA</sub>/ his<sub>PRON</sub> room  
 “Janez feels like eating strawberries in his own room.”
- b. *Janez<sub>j</sub> hoče jesti jagode v svoji/ \*njegovi<sub>j</sub> sobi.*  
 J<sub>NOM</sub> want<sub>3S</sub> eat<sub>INF</sub> strawberries<sub>ACC</sub> in his<sub>ANA</sub>/ \*his<sub>PRON</sub> room  
 “Janez wants to eat strawberries in his own room.”

- 3 Rivero (1992) distinguishes between Greek Advs in VP, which are Aktionsart modifiers and may incorporate to V, and Advs outside VP, which are aspectual modifiers and do not incorporate.

M&Ž mention the ISCs with three Advs in (i.a-b), which combine what they call a frame Adv (Parsons 1990), and two conflicting Time Advs.

- (i) a. *Med vojno se mi je po vojni hodilo vsak dan na Triglav.*  
 during war Refl 1S.Dat Aux after war go every day onto Triglav  
 “During the war I felt like climbing Mt. Triglav after the war every day.”
- b. *Med vojno se mi je vsako dopoldne šlo naslednji dan na Triglav.*  
 during war Refl 1S.Dat Aux every morning go following day onto Triglav  
 “During the war I felt every morning like climbing Triglav the next day.”

### 3.2. Modal Aspectual Operators and parametric variation

Let us now turn from semantics to morphology in Asp<sup>Op</sup>. Slo and Bul differ in aspectual/temporal systems, which affects the morphology of Asp<sup>Op</sup> in ISCs. We address this topic in preliminary form in this section.

Rivero (2005b) proposes that our Asp<sup>Op</sup> (=her atelic operator) displays three characteristics in Bul. It is (a) an overt morphological marker for imperfectivity, (b) in so-called Viewpoint Aspect (Smith 1991), (c) spelled out on the inflected V. Bul representatives of Asp<sup>Op</sup> include the Imperfect Tense inflection *-še* in (19) (without exact equivalent in Slo), inceptive prefix *pri-* in (20a) in contrast with perfective *pro-* in (20b) (both sentences are in the Aorist with definite objects), and imperfective *-va-* on V in the analytic future in (21a), in contrast with the perfective future in (21b). Constructions without aspectual operator marking cannot be ISCs in Bul (for Rivero, marginal ISCs with prefixless Aorist Vs involve coercion, with Aorist aspectually neutral, not perfective).

- (19) a. *Na Ivan mu se čete-še knjigata.* Bul  
 P Ivan 3<sub>S.DAT</sub> Refl read<sub>IMP.3S</sub> book.the  
 “Ivan felt like reading the book.”  
 b. [<sub>AppP</sub> *Na Ivan* [<sub>App</sub> *mu* [<sub>TP</sub> *Past* [<sub>AspP</sub> **Imp**<sup>Op</sup> <sub>VP</sub> [*čete- knjigata*]]]]].
- (20) a. *Na Ivan mu se pri-jadoxa jabulkite.* Bul  
 P Ivan 3<sub>S.DAT</sub> Refl come.to-eat<sub>AOR.3PL</sub> apples.the  
 “Ivan became hungry for the apples.”  
 b. \**Na Ivan mu se pro-spa filma.*  
 P Ivan 3<sub>S.DAT</sub> Refl PF-sleep<sub>AOR.3S</sub> movie.the  
 “\*Ivan felt like sleeping throughout the movie.”

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Rivero (2005b) notes that in (i.a-b) semantics, not syntax, defines which Adv sets the frame and which one the time (Spanish combinations with the Imperfect tense in a modal use are similar). In (i.a), *during the war* is the expression in conflict with *after the war*, so not a frame Adv in Parson’s sense. This is reversed in (i.b); *during the war* sets the frame, and *every morning* establishes the time conflict with *the next day*. For Maienborn, Frame-settings AdvS may reiterate; thus, (i.b) could in principle hold two Frame-setting AdvS followed by an External one. Žaucer notes that in (i.a) the disposition scopes over the second and third AdvS, so (i.a) cannot contain two Frame-setting AdvS. However, (i.a) and (i.b) seem to reduce to (11), with one of their AdvS modifying the universally quantified Adv in each case. That is, in (i.a) *after the war* can be treated as a modifier of *every day* as External Adverb, so adding a fourth Adv further specifies such a External Adv: *every day at 3’oclock after the war*. On this view, in (i.b), *during the war* modifies Frame-setting *every morning*.

- (21) a. *Šte mi se hap-va shokolad utre.* Bul  
 Fut 1<sub>S.DAT</sub> Refl eat-**va**<sub>3S</sub> chocolate tomorrow  
 “I will feel like eating chocolate tomorrow.”
- b. \**Šte mi se hapne shokolad utre.*  
 Fut 1<sub>S.DAT</sub> Refl eat<sub>3S</sub> chocolate tomorrow  
 “\*I will feel like eating chocolate tomorrow.”

Slo has a poorer tense/aspect system than Bul, often using default marking for imperfectivity, so offers a less clear situation than Bul. The combinatorial properties of tense/aspect in ISCs in Slo require future study, but it suffices that relatively close (not totally identical) equivalents of Bul (20a) – where the inceptive combines with the Aorist- are not well-formed ISCs in Slo. However, Slo ISCs cannot be plainly perfective, a first indication that they must contain Asp<sup>Op</sup> like in Bul. As (22a) illustrates, Slo imperfective patterns are ambiguous between the relevant ISC reading, and a *se*-passive reading based on a ditransitive structure with a dative goal (0 stands for no overt marker of imperfectivity). By contrast, perfective patterns such as (22b) have a *se*-passive reading but no ISC reading due to the absence of Asp<sup>Op</sup> (for Sheppard, (in)definiteness in logical object plays no role; Žaucer disagrees).<sup>4</sup>

- (22) a. *Janezu so se pisala pisma.*  
 J<sub>DAT</sub> be<sub>3PL</sub> Refl **0-Asp<sup>Op</sup>** written=Imp letters<sub>NOM</sub>  
 “(The) letters were written to John.” Passive OK  
 “John felt like writing (the) letters.” ISC OK
- b. [<sub>AppP</sub> Janezu [<sub>App</sub> App(se)]<sub>TP</sub> Past [<sub>AspP</sub> ImpOp [**0**]<sub>vP</sub> [pisala pisma]]]].

4 Purely perfective ICS may be marginally acceptable in Slo with intensifying Adv<sub>s</sub> and modalizing particles, as in (i.a) (M&Ž 2006:79a). However, perfective ISCs such as our (23a), and (i.b) are totally unacceptable when stripped of such additions; these judgments are shared by several informants, and Slo linguists present at FDSL 6.5 (Žaucer suggests that (i.b) is odd due to V-initial order, but such an order is very common in Slo, including ISCs).

- (i) a. *Zdejle se mi pa ful prebere kakšen člank.*  
 now Refl I.Dat PTCL so read.through.PF some article.ACC  
 “Right now I so feel like reading through some article.”
- b. \**Prebere se mi kakšen člank.*  
 read.through.PF Refl I.Dat some article.ACC  
 “\*I feel like reading through some article.”

The contrast suggests that modal Adv<sub>s</sub> / particles (most notably Neg) can marginally function as modal operators in ISCs (and elsewhere), with points of contact with Asp<sup>Op</sup>, not a new idea.

- (23) a. *Janezu so se na-pisala pisma.*  
 J<sub>DAT</sub> be<sub>3PL</sub> Refl **na**-written=PF letters<sub>NOM</sub>  
 “(The) letters were written to John.” Passive OK  
 “\*John felt like writing (the) letters.” \*ISC
- b. \*<sub>[AppP Janezu [App’ App [TP Past... PF... pisala pisma]]]</sub>.

With some abstraction, then, Slo (22a) resembles Bul (19), (20a), and (21a), in so far as they all contain Asp<sup>Op</sup>, essential for an ISC analysis. By contrast, Slo (23) is similar to Bul (20b) and (21b), as they all lack the necessary operator.

A second indication that Asp<sup>Op</sup> triggers modality in Slo ISCs comes from secondary imperfectivization. Pattern (24) with V with a perfective prefix and secondary imperfectivization (infinitive *pre-piso-va-ti*) resembles (22a) in having both a *se*-passive and an ISC reading ((in)definiteness in the logical object plays no role). In view of (24), we reach two conclusions. On the one hand, the secondary imperfective marker *-va-* stands for Asp<sup>Op</sup> in Slo ISCs.<sup>5</sup> On the other hand, perfective prefixes do not have an intervention effect on the modal operator, so an ISC analysis may be viable in their presence. Rivero (2005) notes a situation similar to (24) with Bul Vs traditionally dubbed “Perfective Imperfects” (i.e. Imperfect Tense *-še* with a perfective prefix *na-*, as in (25)).

- (24) *Janezu so se pre-pisovala pisma.*  
 J<sub>DAT</sub> be<sub>3PL</sub> Refl **pre**-write<sub>IMP.3PL</sub> letters<sub>NOM</sub>  
 “(The) letters were rewritten for John.” Passive OK  
 “John felt like rewriting (the) letters.” ISC OK
- (25) *Na Ivan mu se na-pisvaše pismoto.* Bul  
 P Ivan 3<sub>S.DAT</sub> Refl PF-write<sub>IMP.3S</sub> letter.the  
 “Ivan felt like writing the letter completely.”

Tense/aspect variation in ISCs is a complex topic beyond the scope of this paper. One difficulty is that the modal role of Aspect, noted in traditional grammars of Romance, Slavic, etc., has attracted attention in generative grammar in English and Romance, but not Slavic. However, a preliminary idea partially unifying the above Slo and Bul phenomena is as follows. If (24-25) contain Asp<sup>Op</sup> in Viewpoint Aspect in (2), then perfective markers will not c-command this item if they are in so-called Inner Aspect in a lower position (perhaps within vP), as roughly shown in (26) (Travis 1992 on Inner Aspect, a.o.). Structural factors could then be one reason why perfective markers are not interveners for the modal effect of Asp<sup>Op</sup> in ISCs.

5 Borer (2005) considers Slavic secondary imperfectivizations structurally parallel to English Progressives, which fits well with the ideas on modality in this paper.

(26) [<sub>AppP</sub> J [<sub>App</sub> App [<sub>TP</sub> Past [<sub>AspP</sub> ImpOp [**va**]<sub>VP</sub> [...PF... *pis...ala pisma*]]]]].

### 3.3. ISCs vs. Psych constructions

In our view, ISCs are monoclausal as in (2=27). For M&Ž, ISCs are roughly as in (3=28), with a matrix null inherently reflexive class III psych V comparable to Italian *piacere* or Slo *luštati* in (29). We see three problems with the null V in (28), and consider (27) with Aspect and a High AppP a preferable analysis.

(27) [<sub>AppP</sub> NP<sub>DAT</sub> [<sub>App</sub> App [<sub>TP</sub> Tense [<sub>AspP</sub> Aspect <sub>VP</sub>[<sub>V</sub> VP]]]]].

(28) [<sub>TP</sub> NP<sub>DAT</sub> [<sub>VP1</sub> [<sub>V1</sub> FEEL-LIKE ... [<sub>VP2</sub> ...[<sub>V2</sub> ]]]]]. (M&Ž)

(29) [*Janezu* [<sub>V1</sub>*se lušta*] [<sub>V2</sub>*delati*]].  
           J<sub>DAT</sub>           Refl like<sub>PRES</sub>           work<sub>INF</sub>  
           “John feels like working.”

A first problem with (28) is that it requires construction-specific processes of an unprecedented type fusing the equivalent of two clauses syntactically or morphologically. It requires clitic climbing and restructuring, which exist in Slo (Golden and Sheppard 2000, Golden 2003), but not Bul or Alb. If ISCs are monoclausal as in (27), no unusual syntactic / morphological processes are needed (Rivero 2005b for more details).

The second difficulty in (28) is that its null inherently reflexive psych V of class III poses a learnability problem in Slo. In this language, *luštati* in (29)—a German borrowing absent in some variants, and thus limited in geography and register—is the only **overt** lexical entry with the required characteristics. No (relevant) overt V is restricted to a dative frame in Slo, as they all alternate, which suggests that the modal reading in ISCs results from compositional semantics applied to (27), without pure “feel-like” Vs (or roots) in the lexicon. For instance, *ljubiti* “like, love” can appear in the Nom-Acc frame in (30a), or in the (30b) ISC frame defined by the main dictionary of Slo (SSKJ) as expressing the willingness of somebody to do something. Thus, (27) can provide the compositional basis for modality in an ISC when coupled to the contribution of (one) *ljubiti*.

(30) a.   *Ana ljubi {Janeza / plesati}*.  
           A<sub>NOM</sub> loves John<sub>ACC</sub> / dance<sub>INF</sub>  
           “Ana loves {John / to dance}.”

- b. *Ani se je (ni) ljubilo plesati.*  
 A<sub>DAT</sub> Refl be<sub>PRES,3S</sub> (Neg) love<sub>NEU</sub> dance<sub>INF</sub>  
 “Ana {felt / didn’t feel} like dancing.”

*Hoteti* “want”, another potential candidate for overt “feel-like” status, also participates in two frames with different compositional semantics: a Nom-Acc one in (31a) and an ISC frame in (31b), which intuitively speaking corresponds to a strong urge. Thus modality in ISCs does not have exactly the same flavor in all instances, and seems to vary on the basis of the contribution of the particular V that enters the frame.

- (31) a. *Ana hoče (piti) vodo.*  
 A<sub>NOM</sub> wants (drink<sub>INF</sub>) water<sub>ACC</sub>  
 “Ana wants (to drink) water.”
- b. *Ani se hoče (piti) vodo.*  
 A<sub>DAT</sub> Refl wants (drink<sub>INF</sub>) water<sub>ACC</sub>  
 “Ana feels like drinking water.”

*Dati* “give”, another candidate for overt “feel-like” status mentioned by M&Ž is multifaceted. It participates in a ditransitive frame (not illustrated), and a reflexive impersonal frame that expresses ability – *To se da narediti*. “This can be done.”–, which seems to contain an indefinite *se* that builds an ISC with a Dative Applicative, as in (R&S 2003). The ISC frame for this V in (32) is defined by the SSKJ dictionary as denoting a readiness or willingness to perform some activity, and ensues only with the dative combined with *se*, which adds support to the idea that the semantics of (32) arise compositionality from (27) in the way adumbrated in (R&S 2003). By contrast, the null V hypothesis in (28) suggests regression for (32), (30b) and (31b), with three clauses and abstract V in the matrix: [TPNP<sub>DAT</sub> [V<sub>I</sub> se FEEL-LIKE [VP<sub>2</sub> *dalo* [VP<sub>3</sub> *delati*]]]].<sup>6</sup>

- (32) *Ani se ni dalo delati.*  
 A<sub>DAT</sub> Refl not.is give<sub>NEU</sub> work<sub>INF</sub>  
 “Ana did not feel like working.”

The third problem with (28) is that Psych constructions and ISCs formally differ. In Slo as in Bul (Rivero 2005b), Psych constructions have nominalized

6 In Spanish, which lacks ISCs for reasons suggested in fn 8, *dar* “give” participates in a dative construction similar to (32). Interestingly, such a construction must refer to an occurring working event: *A Ana le dió por trabajar*. “Ann felt like working (and worked).” If Spanish differs from Slo in lacking null FEEL-LIKE, then (32) must contain a null V so as to capture the difference between the two languages.

counterparts but ISCs do not, as illustrated in (33a-b) with a dative experiencer V, in (34a-b) with an accusative experiencer V, and in (35a-b) with an ISC.

- (33) a. *Film ugaja Ani.*  
 Film<sub>NOM</sub> pleases A<sub>DAT</sub>  
 “The film pleases Ana.”
- b. *Ugajanje filma Ani ...*  
 pleasing film<sub>GEN</sub> A<sub>DAT</sub>  
 “Anna’s pleasure at the film... ”
- (34) a. *Ta film razburja Ano.*  
 This film<sub>NOM</sub> irritates Ann<sub>ACC</sub>  
 “This film irritates Ana.”
- b. *Anino razburjanje nad filmom ...*  
 A<sub>POSS.ADJ</sub> irritation over film<sub>INST</sub>  
 “Ana’s irritation over the film...”
- (35) a. *Janezu se je pilo vodo.*  
 J<sub>DAT</sub> Refl be<sub>3S</sub> drunk<sub>NEU</sub> water<sub>FEM.ACC</sub>  
 “John felt like drinking water.”
- b. *Janezovo pitje vode je bilo zabavno.*  
 J<sub>POSS.ADJ</sub> drinking water<sub>GEN</sub> be<sub>3S</sub> been amusing  
 “John’s drinking water was amusing.”  
 “\*John’s urge to drink water was amusing.” \*ISC

Rivero (2005b) attributes the absence of nominalized ISCs to the High Applicative in (27), proposing that such a functional category takes a complement that must be a TP, which is not possible in nominalizations.

In sum, in §3 we motivated two elements of the ISC structure in (2=27): (a) Aspect, and (b) the High Applicative. On the one hand, ISCs must contain an imperfective component as modal operator. Therefore, they resemble English Progressives as to Adv modification, and Bul ISCs in so far as they cannot be purely perfective. On the other hand, ISCs differ from Psych constructions because they lack nominalized counterparts, since their High Applicative must take a TP-complement.<sup>7</sup>

7 A difference first observed by G. Dukova in Bul is that psych Vs do not form ISCs, and R. Žaucer asks why. *Janezu se dopade glasba* J<sub>DAT</sub> Refl please<sub>3S</sub> music<sub>NOM</sub> “Music appeals to J.” cannot be an ISC because this V does not participate in one of its building blocks: i.e. impersonal/ passive *se* constructions with properties as in (R&S 2003). In terms of our analysis, such Vs cannot participate in constructions with an indefinite variable for the external argument of V that the Applicative could bind. Another difference is

#### 4. ISCs differ from Inchoatives with Datives: Answering Q3

In this section, we argue that ISCs should not be identified with Inchoatives with dative involuntary agents.

Alb, Polish, Spanish, and Slo are languages with Inchoatives that can be equipped with involuntary agents in the dative (Kallulli 1999, 2006, Rivero 2003, 2004, R&S 2003: §5.5), as in (36a) for Alb, and (36b=4) for Slo.

- (36) a. *Anës i- u thyen gotat.* Alb  
 A<sub>DAT</sub> 3<sub>S,DAT</sub>-Non-act.Aor break<sub>3PL</sub> glasses.the<sub>NOM,PL</sub>  
 “Anna broke the (drinking) glasses (involuntarily).”
- b. *Janezu so se z-lomila očala.*  
 J<sub>DAT</sub> be<sub>3PL</sub> Refl PF-broken<sub>PL</sub> glasses<sub>NOM,PL</sub>  
 “John broke the (seeing) glasses involuntarily.”

The Inchoative constructions in (36a-b) morphologically resemble all Alb ISCs with transitive Vs, and a subset of Slo ISCs with transitive Vs, as the comparison with (37a=9) and (37b=7) suggests.

- (37) a. *Anës i lexo-hen dy libra.* Alb  
 A<sub>DAT</sub> 3<sub>S,DAT</sub> read<sub>NON.ACT.PRES.3PL</sub> two book<sub>NOM,PL</sub>  
 “Ann feels like reading two books.”
- b. *Janezu se je pila voda.*  
 J<sub>DAT</sub> Refl be<sub>3S</sub> drunk<sub>FEM,S</sub> water<sub>FEM,S,NOM</sub>  
 “John felt like drinking water.”

Similarities above include nonactive/reflexive markers in both, Vs in agreement with nominative logical objects, and animate dative logical subjects with a “lack-of-control” reading. Given such parallelisms, a question is whether the two constructions should be unified in UG. In the literature, there are two different answers to this question. On the one hand, R&S (2003) and Rivero (2003, 2004) suggest that they should be kept apart, an idea we further motivate in this paper. On the other hand, Kallulli (1999, 2006), stressing morphological properties in Alb, pursues a research program that unifies them.

Slo supports the hypothesis that ISCs and Inchoatives with dative agents differ in fundamental ways from two independent perspectives.<sup>8</sup> First, we saw in

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that, unlike psych constructions of the type just mentioned, Bul ISCs are subject to person restrictions on nominatives (Rivero 2005a), a topic beyond the scope of this paper.

8 Additional crosslinguistic evidence keeping the two constructions apart is that they need not co-occur in a given language. Languages with Inchoatives with datives as involuntary agents such as Spanish, Polish, and Czech/Slovak (or Salish) lack ISCs. Languages with

§2 that Slo ISCs with transitive Vs can appear in two morphological patterns. The ISC morphological pattern reminiscent of Inchoatives is in (37b): a dative subject, and a nominative object in agreement with V. The other Slo pattern with accusative object and a default V is as in (10a=38), so is morphologically different and not reminiscent of an Inchoative.<sup>9</sup>

- (38) *Janezu se je pilo vodo.*  
 J<sub>DAT</sub> Refl be<sub>3S</sub> drunk<sub>NEU</sub> water<sub>FEM.ACC</sub>  
 “John felt like drinking water.”

The above contrast is significant to show that unaccusativity is not essential to ISCs, contra Kallulli, so transitive ISCs and Inchoatives cannot be unified on such a basis. The hypothesis that unaccusativity is crucial to ISCs is equally problematic with intransitive Vs, since we saw in §2 that Vs usually identified as unaccusative and unergative both participate in ISCs. In the unaccusativity approach, the role of *se* / NAct marking in ISCs with Vs such as *live* looks puzzling; such Vs do not associate with accusative case or an external role, so there is no need to manipulate either via morphological markers. This problem does not affect R&S (2003), who propose that *se* in ISCs signals a variable for the external / only argument of the predicate bound by the dative logical subject for Vs called unaccusative, unergative, or transitive.

Second, Aspect differentiates ISCs from Inchoatives in Slo, arguing against unification in UG. Interpretation makes clear that ISCs and Inchoatives differ in modality; Inchoatives can denote occurring events depicted by V, which ISCs cannot. The claim in this paper, however, is that ISCs depend on Aspect for modality, so must contain an imperfective ingredient, as in §3. By contrast, Inchoatives with datives do not rely on Aspect, and can be either perfective or imperfective without conflict, as mentioned by R&S (2003) and shown next.

The combination of Aspect with the two morphological patterns for transitive ISCs in Slo provides a sophisticated tool to distinguish them from Inchoatives. The Slo patterns with a nominative object in agreement with V have morphological counterparts in Alb. When they are imperfective as in (39),

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ISCs such as Bul may lack Inchoatives with datives as involuntary agents, because such datives are preferably interpreted as possessors (Rivero 2004), suggesting Possessor Raising. Such gaps are unexpected if the two constructions belong to one unique type in UG. In our analysis, ISC-less languages differ from Alb, Slo, and other South Slavic languages with ISCs in lacking Applicatives over Tense/Aspect, but may have (more familiar) High Applicatives below Tense/Aspect.

9 R. Žaucer considers Slo ISCs with nominatives archaic/marginal/less natural. Speakers consulted by Sheppard find such ISCs to be on a par with those with accusatives.

such patterns are ambiguous between an ISC reading (39a), with a dative as experiencer of a feeling about a non-occurring event, and an Inchoative reading (39b), with a dative as involuntary agent of an occurring event. The generic Adv in (39) is optional, without effect on either reading.

- (39) *Janezu so se (kar naprej) razbijali kozarci.*  
 J<sub>DAT</sub> be<sub>3PL</sub> Refl (all-the-time) break<sub>IMP.MASC.PL</sub> glasses<sub>MASC.NOM.PL</sub>  
 (a) “John felt like breaking glasses (all the time).” ISC OK  
 (b) “John unintentionally broke glasses (all the time).” Inchoative OK

By contrast with (39), perfective frames with agreeing nominatives as in (40) have an Inchoative reading with a dative as involuntary agent, (40b), but lack an ISC reading: (40a). Thus, ISCs require imperfectivity as modal operator, while Inchoatives have no essential need for a modal operator, but can tolerate it: (39).

- (40) *Janezu so se razbili kozarci.*  
 J<sub>DAT</sub> be<sub>3PI</sub> Refl break<sub>PERF.MASC.PL</sub> glasses<sub>MASC.NOM.PL</sub>  
 (a) “\*John felt like breaking (the) glasses” \*ISC  
 (b) “John unintentionally broke (the) glasses.” Inchoative OK

Turning now to default V and accusative logical object in (41), which has no morphological counterpart in Alb, imperfective frames of such a type have only an ISC reading, with dative as experiencer of a non-occurring event: (41a). They lack an Inchoative reading: (41b). Thus, Inchoatives with datives are essentially tied to unaccusative frames, while ISCs need not be.

- (41) *Janezu se je (kar naprej) razbijalo kozarce.*  
 J<sub>DAT</sub> Refl be.<sub>3S</sub> (all-the-time) break<sub>IMP.NEU</sub> glasses<sub>ACC.PL</sub>  
 (a) “John felt like breaking glasses (all the time).” ISC OK  
 (b) “\*John unintentionally broke glasses (all the time).” \*Inchoative

Finally, perfective patterns with default Vs and accusative objects not illustrated cannot be ISCs in Slo, because they are not imperfective, or Inchoatives with dative involuntary agents because they are not unaccusative.

To conclude §4, Aspect is essential for ISCs, which cannot be perfective, but does not contribute to / interfere with Inchoatives with dative involuntary agents. Unaccusativity is essential to Inchoatives with datives, but does not contribute to / interfere with ISCs. ISCs and Inchoatives cannot be identified in UG due to a fundamental modal contrast regarding non-occurring vs. occurring events, added to the two noted formal differences.

## 5. Conclusions

ISCs derive intensionality from an aspectual operator in a modal/ “futate” role, like English sentences in the Progressive, and unlike constructions with Psych Vs. ISCs contain a Dative Applicative above TP, so do not nominalize. They rely on Aspect, not unaccusativity, so must be imperfective, but may display accusative objects. ISCs differ from Inchoatives with datives involuntary Agents, which exist in Slo, but rely on unaccusativity, not Aspect.

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*Peter Staroverov*

## **Type-shifting and lexical semantics in the interpretation of Russian conjoined relational nouns<sup>\*</sup>**

### **1. Introduction**

Relational nouns can be roughly defined as nouns having more than one argument (DeBruin and Scha 1988, Lander 2000). Sometimes it is difficult to say if a noun belongs to this class or not (cf. *boss*, *picture*). A noun may have both a relational and a non-relational (**sortal**) reading (cf. Vikner and Jensen 2002: 204-205). However, all the examples I give in this paper are clear examples of relational nouns. Throughout this paper, I will follow Lander (2000) in using the terms **referent** and **correlate** to refer to the two arguments of relational nouns.

This paper is mainly focused on Russian language although many of my claims can easily be extended to cover the data of other languages. To demonstrate the quantificational properties of conjoined relational nouns, I will sometimes also refer to English examples as Russian does not have overt articles.

My general aim is to compare the behavior of relational and sortal nouns in coordination construction. I will try to demonstrate that there is one type of conjunction that occurs only with certain relational nouns and does not occur with sortal nouns at all. This case is illustrated in (1).

- (1) *V romane r'eč idet o muže i žene.*  
 In novel<sub>PRP</sub> discourse go about husband<sub>PRP</sub> and wife<sub>PRP</sub>  
*"The novel is about a husband and wife."*

The two conjoined relational nouns in (1) refer to two people who are *husband and wife* of each other and cannot refer to, say, speaker's husband and listener's wife. I will refer to such cases as the instantiations of **reciprocal conjunction of relational nouns**.

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\* I would like to thank Barbara Partee for encouraging me to carry out this work and for her extremely useful comments on the first draft of this paper, James Pustejovsky for the discussion of possible qualia structures of relational nouns, Igor Yanovich for his comments on the pragmatics of coordination and Sergey Tatevosov for his valuable comments. I am also grateful to the audience of FDSL 6.5 conference in Nova Gorica and to the anonymous reviewers. The errors remain, of course, my own.

The existing theories of coordination semantics (Winter 2001, see references therein for the previous proposals and cf. Heycock and Zamparelli 2005) are mainly aimed at analyzing one-place nouns in coordination construction. Therefore the phenomenon that is specific to two-place nouns has been left without attention.

The reciprocal conjunction is not easy to capture within the existing theories of conjunction. The account of Winter (2001) predicts that both arguments of the conjoined semantic predicates should always end up coreferent. This is clearly not the case in (1) where the referent of the first relational noun is coreferent to the correlate of the second one and vice versa. I will consider this problem in more detail in section 2.3. I will demonstrate that the recently proposed alternatives to Winter (2001, e. g. Heycock and Zamparelli 2005) are generally hard to extend to the case of two-place noun coordination (1).

I will propose a compositional analysis of reciprocal conjunction based on the theories of Winter (2001) and Eschenbach (1993). Finally, I will draw some highlights to formulating the precise lexical restrictions on the reciprocal conjunction.

The rest of the paper is laid out as follows. In section 2, I will argue that we can distinguish between at least three types of conjunction for relational nouns and demonstrate that the reciprocal conjunction is in fact the only one that is problematic. Section 3 presents a compositional analysis of reciprocal conjunction. Section 4 is devoted to formulating the lexical restrictions on reciprocal conjunction and section 5 concludes the paper.

## **2. Conjunction of relational nouns compared to conjunction of sortal nouns**

In this section, I will briefly compare the interpretation of conjoined relational nouns to that of conjoined sortal nouns. I will argue that the two types of interpretation available for sortal nouns in coordination construction are also available for relational nouns. However, there is one more interpretation that is only available to certain relational nouns. As such, this interpretation can not be treated either as a case of intersective conjunction or as a case of group-forming conjunction.

### **2.1. Intersective conjunction**

Winter's (2001) semantics for conjunction (which is a slight modification of Partee and Rooth's (1983) *generalized conjunction* and roughly corresponds to Heycock and Zamparelli's (2005) *joint reading*) traces the meaning of the

conjoined phrase down to set intersection. The expected interpretation of coordination is illustrated by the example (2).

- (2) *Van'a - xorošij skripač i krasivyj mužčina.*  
 Vania good violinist and handsome man  
 "Vania is a good violinist and a handsome man."

Here, both conjoined properties apply to the same entity. The same interpretation schema can be applied to the quantifier meanings of the NP's in argument position as in (3).

- (3) *I saw a soldier and a sailor in the yard.*

In this example, the DP *a soldier* denotes the set of predicates such that there is a soldier for which such predicates hold ( $\lambda P \exists x(\text{soldier}'(x) \wedge P(x))$ ). Intersecting this set with an analogous set for *a sailor* allows us to arrive at a right interpretation of (3).

In Russian, which lacks overt determiners, the semantic derivation of similar examples may be problematic.<sup>1</sup> However, this is not because Russian coordination is interpreted differently from English coordination. The problem here is how to extend the analysis of English to a language without obligatory overt determiners. This problem goes beyond the scope of the present paper.

What is important for our current purposes is that intersective conjunction can also occur with relational nouns as illustrated in (4).

- (4) *Van'a - moj drug i kollega.*  
 Vania my friend and colleague  
 "Vania is my friend and colleague."

In this example, the conjoined relational nouns have both the same referent and the same correlate. If we assume that the denotations of relational nouns are sets of pairs, we immediately get the right interpretation by intersecting the set of pairs  $\langle x, y \rangle$  such that  $x$  is a friend of  $y$  with the set of pairs  $\langle u, v \rangle$  such that  $u$  is a colleague of  $v$ .

## 2.2. Group-forming conjunction

The intersective conjunction schema can not capture the examples like (5) where the whole conjoined phrase contains just one determiner. In the literature, the

1 For example, it might be difficult to tell DP-conjunction and DP-internal conjunction apart (see Heycock and Zamparelli 2005 for a discussion of DP-internal conjunction).

terms *split reading* (Heycock and Zamparelli 2005), and *non-boolean conjunction* (Krifka 1990) have also been used to refer to such examples.

- (5) *Eti mužčina i ženščina l'ub'at drug druga.*  
 This<sub>PL</sub>man and woman love<sub>3PL</sub> each other  
 "This man and woman love each other."

Roughly speaking, the problem here is that *man and woman* does not refer to one entity which is both a man and a woman at the same time.

The intersective schema predicts such split readings for DP-conjunctions like *a sailor and a soldier* where the two variables in the denotations of conjoined nouns are existentially bound from the beginning. However, in the Russian example (5) and in its English translation the variables in *man'(x)* and *woman'(x)* are not bound and hence the intersective conjunction gives wrong predictions.<sup>2</sup>

There have been several attempts to account for such deviations from the intersective conjunction schema. Krifka (1990) develops the original idea of Link (1983) that in such cases the whole conjunction refers to a group containing the conjuncts. He generalizes Link's  $\oplus$  operator to apply to arbitrary types. The assumption that the whole coordinate structure quantifies over groups immediately explains why the conjoined phrase can have just one determiner.

An alternative account has recently been proposed by Heycock and Zamparelli (2005). They attempt to propose a unified meaning for *and* based on the cases like (5).<sup>3</sup> However, they give only a very tentative idea of how their account can be generalized to cover the intersective conjunction in case of DP coordination and coordination of other categories. Furthermore and more importantly, there is no simple way to generalize their account to two-place nouns. The semantic operation that they assume to correspond to coordination (**set product**) essentially picks out all the members of the set denotations of the conjuncts and returns a set containing the unions of those members in all possible combinations.

If we assume that relational nouns denote sets of pairs (not sets of individuals as Heycock and Zamparelli assume), the denotation of a phrase like *friend and colleague* should contain, among others, a set of two pairs

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2 Another interesting problem is how to explain the difference between, say, English allowing for a singular determiner in the examples like (5) and Russian requiring the determiner to be plural. See King and Dalrymple (2004), Heycock and Zamparelli (2005) for the discussion of determiner agreement with coordinate phrases.

3 Winter (2001) tries to generalize the intersective schema to all cases by stipulating wide scope for conjunction in the cases like *every cat and dog*. I agree with the criticism of Winter's approach in Heycock and Zamparelli (2005: 35-37)

{<x,y>,<u,v>} where *x* is a friend of *y* and *u* is a colleague of *v*. However, there is no context in which *friend and colleague* can refer to a friend of *y* and a colleague of *v* with all the four individuals distinct and it is not clear what might be the mechanism that would filter out the undesired pairs from the denotation of coordinate structure.

Note that the assumption that the relational nouns denote sets of pairs is justified by numerous works on the semantic, pragmatic and morphological behavior of relational nouns (see Asudeh 2005, Lander 2000, Vikner and Jensen 2002, De Bruin and Scha 1988, Partee 1989, Barker 1999 among others).

On the contrary to Heycock and Zamparelli, Krifka (1990) generalizes his operator to be applicable to two-place nouns. On his account, two relational nouns conjoined by group-forming schema should have different referents but the same correlate. This is the right interpretation for conjoined relational nouns combined with possessors (6).

- (6) *Sosed i podrugā Vasi prišli k nemu na prazdnik.*  
 Neighbor and friend<sub>FEM</sub> Vasia<sub>GEN</sub> come<sub>PL.PST</sub> to him<sub>DAT</sub> to party<sub>ACC</sub>  
 "Vasia's (female) friend and (male) neighbor came to his party."

The interpretation derived by Krifka's operator describes *sosed i podrugā* as referring to a group of people that has two parts with one being a neighbor of Vasia and the second being a friend of Vasia.

To sum up the discussion of group-forming conjunction, the account of Krifka (1990) captures the occurrences of conjoined relational nouns with a possessor. Several alternatives to Krifka's account have been proposed (see the references in Winter 2001, chapter 2). However, I do not aim to make a motivated choice between those options here as my main concern is the reciprocal interpretation.

### 2.3. Reciprocal conjunction

The reciprocal conjunction that will be the main focus of the rest of the paper is illustrated in (1) repeated here as (7).

- (7) *V romane reč idet o muže i žene.*  
 In novel<sub>PRP</sub> discourse go about husband<sub>PRP</sub> and wife<sub>PRP</sub>  
 "The novel is about a husband and wife."

Interestingly, the reciprocal conjunction is the only type of conjunction interpretation that can not occur with sortal nouns. The very basic semantic properties of reciprocal conjunction require the conjuncts to have two arguments.

In what follows, I will consider the relation between the reciprocal conjunction and other types of conjunction briefly described in the previous sections.

First of all, the reciprocal conjunction can not be captured by the intersective schema. Consider, for example, the pair *brother and sister*. The set of pairs  $\langle x, y \rangle$  such that  $x$  is a brother of  $y$  clearly does not intersect with the set of pairs  $\langle u, v \rangle$  such that  $u$  is a sister of  $v$ . The first members of each pair in the first set are males but the first members of each pair in the second set are females. In other words one person can not be both a sister and a brother to some other person. Therefore the intersective schema can not be applied in this case.

Similar reasoning is valid for *husband and wife*, *teacher and pupil* and many other examples of reciprocal conjunction. As a preliminary generalization about the relational nouns giving rise to reciprocal conjunction we may formulate the following:

(8) *The reciprocal conjunction arises when the sets in the denotations of the two conjoined relational nouns do not intersect.*

On the contrary to the examples of reciprocal conjunction, the relational nouns giving rise to intersective conjunction such as *friend'* and *colleague'*, (4), always have a non-empty intersection.

An empty intersection is not a sufficient condition for two relational nouns to be conjoined reciprocally. For example the sets denoted by the words *copy* and *brother* have an empty intersection. This is due to the fact that both arguments of *copy* must be inanimate while both arguments of *brother* must be animate. However, the phrase *copy and brother* can not get a reciprocal interpretation. Additional restrictions on the reciprocal interpretation will be addressed in section 4.

To sum up, the reciprocal interpretation can not be derived by direct application of the intersective conjunction. In what follows, I will demonstrate that any account of group-forming conjunction can not capture the reciprocal reading either. This becomes clear as we see that the group-forming conjunction can apply to the relational nouns in question to produce examples ambiguous between the reciprocal and the group reading. These examples come from conjoined relational nouns in argument positions.

(9) *John invited an uncle and nephew to the party.*

(9)<sup>4</sup> is clearly ambiguous between the reciprocal reading on which *uncle* and *nephew* are related to each other but are not *John's* relatives and the group reading on which they are *John's uncle and nephew* (and hence probably a great-uncle and great-nephew of each other). I suggest that the reciprocal reading of (9) is derived by the same mechanism as the reciprocal reading in (7), while the non-reciprocal reading occurs as a result of group-forming conjunction. As the example (9) is clearly ambiguous we obviously need to distinguish between two different interpretations here.

To sum up, the existing approaches to coordination semantics can not capture the reciprocal conjunction.<sup>5</sup> The next section provides a compositional analysis that derives the reciprocal conjunction without postulating an additional meaning of *and*.

### 3. Compositional semantics for reciprocal conjunction

A question immediately arises as we look at the data in section 2: do we need to postulate a separate meaning of *and* (and its counterparts in other languages) to capture the reciprocal conjunction? This evident solution is probably not so attractive.

Even if we postulate three different meanings of *and*, we do not get examples that are three-ways ambiguous because the reciprocal reading is in complementary distribution with the intersective reading. This complementary distribution makes it desirable to treat the reciprocal interpretation as a variant of the intersective interpretation. On the other hand, the reciprocally coordinate

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4 Special thanks are due to Barbara Partee for pointing the English examples of this kind to me. In the analogous Russian examples (i) it is not clear if the English translation should contain two determiners or just one.

(i) *Vas'a pozval d'ad'u i plem'annika na prazdnik*  
 Vasia call<sub>PST.M</sub> uncle<sub>ACC</sub> and nephew<sub>ACC</sub> to party<sub>ACC</sub>  
 "Vasia called an uncle and a nephew to the party."

See footnote 6 for a discussion of English sentences containing coordination and multiple determiners (*an uncle and a nephew*). I propose to analyze such examples as cases of intersective conjunction.

5 An issue that is also worth investigating is how the different theories of implicit arguments (Asudeh 2005, Partee 1989, Dekker 1993 among others) perform when analyzing the reciprocal conjunction and more generally the conjunction of relational nouns. I will not deal with these issues in this paper. It is clear that neither of the mentioned theories of implicit arguments can provide a compositional semantic account of coordination in this case.

structures seem to be better analyzed as referring to groups as they allow for just one article in English.<sup>6</sup>

These dual properties of reciprocal conjunction will receive a straightforward explanation on my analysis. I suggest that the reciprocal reading is derived by a combination of intersective conjunction with a special collectivity operator. On my account the derivation of reciprocal conjunction has three essential steps.

We start from the denotations of the conjoined relational nouns like  $\lambda x.\lambda y.R(x)(y)$ . First, the denotations of the two relational nouns are adjusted to make the intersective conjunction applicable. Second, the intersective conjunction applies. Third, a special collectivity operator derives the right result.

The intersective conjunction schema (Winter 2001: 23) is defined as follows:

$$(10) \quad \sqcap_{\tau(\tau\tau)} = \begin{cases} \wedge_{t(ut)} & \text{if } \tau = t \\ \lambda X_{\tau}.\lambda Y_{\tau}.\lambda Z_{\sigma_1}.X(Z)\sqcap_{\sigma_2(\sigma_2\sigma_2)}Y(Z) & \text{if } \tau = \sigma_1\sigma_2 \end{cases}$$

In the section 2.3, I have argued that this schema can not be directly applied to the two relational nouns like *brother* and *sister* because their denotations have an empty intersection. However, it is important to notice that this schema can be applied to such relational nouns and give a non-empty intersection if the arguments of one of the relational nouns get inverted. On my account, this inversion happens to the second relational noun. The operator responsible for the inversion is defined in a following way:

$$(11) \quad \text{inv}_{(eet)(eet)} \stackrel{\text{def}}{=} \lambda Y_{eet}.\lambda u.\lambda v.Y(v)(u)$$

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6 In fact even a more precise formulation seems to be true: the reciprocal conjunction *requires* just one article. For instance, the sentence in (7) could not get a continuation like "who were not married to each other". Consider on the contrary the amazon.com description of some movie:

(i) *A hilarious movie about a husband and a wife who fall in love. Only they are not married to each other.*

The reciprocity in this case becomes a pragmatic matter. As suggested to the author by Barbara Partee (p. c.), such cases in English can be derived by the intersective conjunction of DPs. In this case the relational nouns shift to one-place predicates by existentially quantifying the correlate in order to combine with the ordinary version of the article. The "relational" version of *a* proposed in Partee (1999) would lead to a crash in derivation. To derive the "default" reciprocal meaning of *a husband and a wife* we might appeal to a plausible pragmatic principle that would always require the conjuncts to be somehow related (first suggested to me by Igor Yanovich). We leave the detailed examination of such pragmatic possibilities for future research.

This operator may be viewed as a type-adjustment operator triggered by the fact that the normal intersective conjunction would yield an empty set applied to the two relational nouns in question.

The application of *inv* automatically restricts the reciprocal conjunction to pairs of nouns and to nouns having just two arguments. This is the correct result as we have no evidence of more-than-2-place nouns giving rise to the reciprocal conjunction or of the conjunctions of more than two nouns licensing the reciprocal interpretation.<sup>7</sup>

As noted above, after the application of *inv* the intersective schema can be applied to, say, *brother'(x)(y)* and *sister'(y)(x)*. The successive application of the operators in (11) and (10) gives the result below.

$$(12) \quad \lambda x.\lambda y[R_1(x)(y) \wedge R_2(y)(x)]$$

This formula is then an input to a special collectivity operator similar to the one deriving the reciprocal meaning for plurals in Eschenbach (1993).<sup>8</sup> This operator essentially takes a reciprocal relation and returns a pair of entities connected by that relation.

$$(13) \quad \lambda R\lambda Z\exists x\exists y[Z = x \oplus y \wedge R(x)(y)]$$

The  $\oplus$  in this formula can be viewed as a standard group-forming operator of Link (1983) (see also Krifka 1990). The application of (13) correctly describes the quantificational properties of the reciprocal conjunction. The resulting semantic representation of *brother and sister* is given in (14).

$$(14) \quad \lambda Z\exists x\exists y[z = x \oplus y \wedge \textit{brother}'(x)(y) \wedge \textit{sister}'(y)(x)]$$

This formula can roughly be translated as "a pair of individuals *x* and *y* such that *x* is a brother of *y* and *y* is a sister of *x*". My account immediately predicts that *brother and sister* can be used with just one article and derives the

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7 As first pointed out to me by Segey Tatevosov, we should also seek for additional motivation for this operator from other aspects of behavior of relational nouns. I hope to find such motivation in my future research. One way or another, to derive the reciprocal conjunction we need to invert the arguments at some point although this may be made a constituent part of some other operator.

8 This similarity is important because we want to derive the reciprocal meaning for *sisters* and *brother and sister* by similar mechanisms. However, the detailed comparison of reciprocal interpretation in plurals and coordinate structures remains a matter of future research.

right result when such pairs occur in predicative contexts, (15), given the standard assumptions about the semantics of copula.<sup>9</sup>

- (15) *Van'a i Maša - brat i sestra.*  
 Vania and Masha brother and sister  
 "Vania and Masha are brother and sister."

Note, that the derivation proposed above crucially includes the application of intersective conjunction schema. Hence we treat the reciprocal conjunction as a variant of intersective conjunction. We do not postulate a third special meaning of *and* for reciprocal cases. Such an account successfully avoids postulating the redundant ambiguity as intersective conjunction and reciprocal conjunction are in complementary distribution.

A possible alternative to the 3-step derivation proposed above would be to design a single operator that applies to two relations and to integrate the inversion of arguments into this operator.<sup>10</sup> However, such an account would have to evoke additional speculations explaining why we do not get the examples that are ambiguous between the three readings of *and*. Furthermore, in the next section it will be argued that the lexical restrictions on reciprocal conjunction mimic the proposed derivation schema.

#### 4. Additional restrictions on reciprocal conjunction

It is clear that not all the pairs of relational nouns give rise to reciprocal interpretation in coordination construction. In section 2.3, I have formulated the following preliminary generalization:

- (16) *The reciprocal conjunction arises when the sets in the denotations of the two conjoined relational nouns do not intersect.*

In this section, I will demonstrate that this generalization should rather be treated as a tendency. I will propose a refined version of the lexical restriction,<sup>11</sup>

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9 Russian copula has a null form in present tense but surfaces in past tense indicating that the sentences like (15) should indeed be analyzed as having a copula.

10 This idea was first suggested to me by Barbara Partee.

11 An alternative possibility that I will not treat here in detail was first noted by Barbara Partee. Instead of formulating the fixed lexical restrictions we might say that the reciprocal interpretation is available for all the pairs of relational nouns, but in some cases it is filtered out by some pragmatic mechanism. Intuitively, this is less plausible because the amount of pairs of relational nouns usually giving rise to reciprocal conjunction is rather small compared to the amount of all possible relational noun pairs. Furthermore, it seems

based on the observations of Schwarz (2006) and Von Stechow (1999) and show how it is connected to the derivation of reciprocal conjunction.

#### 4.1. Does the empty intersection requirement really hold?

In section 2.3, I have noted that the generalization (16) can only be viewed as a necessary requirement that two relational nouns must fulfill in order to give rise to reciprocal interpretation in coordination construction. It is not a sufficient requirement, that is there are pairs of relational nouns that satisfy (16) but do not give rise to reciprocal interpretation.

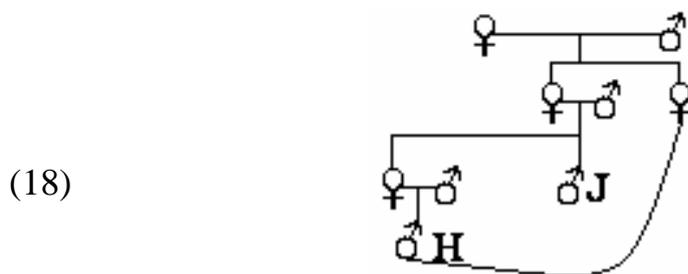
One of such pairs is *brother* and *copy*. The two relational nouns arguably have an empty intersection because brothers are animate but copies are not. However the conjoined phrase *a brother and copy* does not seem to have a reading like 'a brother and his copy'.

One might try to maintain the initial generalization (16) by arguing that *brother*' and *copy*' in fact do have a non-empty intersection as the example (17) suggest.

(17) *Bill is a brother and copy of John.*

A more detailed analysis of this example would probably say that the noun *copy* undergoes some kind of lexical shift here. However, even if we accept that all the pairs of relational nouns giving rise to reciprocal interpretation have disjoint denotations, there is still a problem with the requirement (16), namely that it is not sufficient.

The relational nouns *uncle* and *nephew* clearly give rise to reciprocal interpretation but there are situations where these nouns have a non-empty intersection.




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unclear what might be the pragmatic principle ruling out the reciprocal interpretation for *friend and colleague*.

Assume that in model M John's nephew Harry marries his aunt<sup>12</sup> (see the genealogical tree in (18)). Then it will be possible to refer to Harry as both *John's uncle* and *John's nephew*. In this model *uncle'* and *nephew'* clearly have the pair <Harry, John> in their intersection.

The nouns *uncle* and *nephew* constitute a clear counterexample to (16). Because of this counterexample and the example above, we reject (16) as a formulation of lexical restrictions on reciprocal conjunction. However, the fact that most of the pairs of relational nouns giving rise to the reciprocal interpretation have disjoint denotations remains an interesting observation to be explained.

#### 4.2. Strawson-inverseness

Intuitively, what makes the reciprocal interpretation in coordination construction possible for the nouns *uncle* and *nephew* is the inverseness of the two nouns. I will call two relations  $R_1$  and  $R_2$  inverse if their denotations consist of inverse pairs and the inference in (19) holds.

$$(19) \quad R_1(x)(y) \rightarrow R_2(y)(x)$$

Generalizing this case we might say that two nouns should denote inverse relations to give rise to the reciprocal interpretation in coordination construction.

The inverseness requirement can not be true as it stands because, for instance, *brother* is not inverse to *sister*. Schwarz (2006) proposes a way to loosen an analogous requirement for the case of restrictions on reciprocal plural relational nouns like *sisters*. He suggests that a relational noun should be Strawson-symmetric to give rise to a reciprocal plural interpretation. The notion of Strawson-symmetry is derived from the notion of Strawson-entailment that has been argued by Von Stechow (1999) to be relevant for NPI licensing. The definition of Strawson-entailment is given in (20) below.

$$(20) \quad A \text{ Strawson-entails } B \text{ iff the conjunction of } A \text{ and the presuppositions of } B \text{ entails } B.$$

I will use the symbol  $\overset{s}{\rightarrow}$  for Strawson-entailment. Assuming that a relation R is symmetric whenever  $R(x)(y) \overset{s}{\rightarrow} R(y)(x)$ , the only thing that we need to do to get Strawson-symmetry is to replace the entailment with Strawson-entailment in this formula. This operation is proposed by Schwarz (2006) and he

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12 I am grateful to an anonymous reviewer for this counterexample to my empty intersection generalization.

argues that, although for instance *sister'* is not a symmetric relation, it is Strawson-symmetric.

In fact the gender information carried by *sister* does not seem to be lost under negation, *perhaps* or questions. All of the examples in (21) convey that Kim is a female.

- (21) a. *Kim isn't his sister.*  
 b. *Perhaps Kim is his sister.*  
 c. *Is Kim his sister?*

In parallel to the proposal of Schwarz (2006), I would like to argue that Strawson-inverseness is relevant for the availability of reciprocal interpretation in case of conjoined relational nouns.

- (22)  $R_1$  and  $R_2$  are Strawson-inverse relations iff  $R_1(x)(y) \xrightarrow{s} R_2(y)(x)$

The restriction on reciprocal conjunction is formulated as follows:

- (23) *The reciprocal interpretation of two relational nouns in coordination construction is available iff these relational nouns denote Strawson-inverse relations.*

All relations that are inverse are Strawson-inverse. However, because the Strawson-inverseness is a weaker requirement than inverseness it enables us to capture the pairs like *brother* and *sister* or *mother* and *daughter*. Notice, that Strawson-inverseness, as formulated in (22), and Schwarz's (2006) Strawson-symmetry requirement on the very similar interpretation in plural relational nouns can be reduced to one restriction. In fact the definition of Strawson-inverseness becomes the definition of Strawson-symmetry if we replace  $R_1$  and  $R_2$  with the same relation  $R$ . Hence adopting (23) seems promising if we want to analyze the similar interpretations of *sisters* and *brother and sister* similarly.

To explain the case of *brother and copy* we need to make one further refinement to the notion of Strawson-entailment. It may be argued on the basis of examples similar to the ones in (21) that the inanimacy requirement is also a presupposition carried by the word *copy*. But then the conjunction of *brother(x)(y)* and *inanimate(y)* would be false and hence would entail everything.

To avoid such vacuous entailment it should be added to (20) that the inference from A and the presupposition of B to B should be checked only when the conjunction of A and the presupposition of B is true. This is a plausible

amendment because otherwise whenever A contradicts the presupposition of B A would be predicted to Strawson-entail B.

Let us now consider the connection between the proposed lexical restrictions on reciprocal interpretation and our derivation of reciprocal conjunction. It turns out that the pairs of relational nouns that take part in the derivation of reciprocal conjunction always have Strawson-inverse denotations. Somewhat loosely, we may say that the only difference between those nouns can be avoided by applying *inv* to one of the nouns. If we forget about presuppositions for a moment, for two relations conjoined reciprocally  $R_1(x)(y)$  is equivalent to  $R_2(y)(x)$ . Therefore our schema predicts that the whole conjunction like *brother and sister* ends up meaning a pair of people connected by the relation that is common to both nouns.

*Inv* can be viewed as an operator that adjusts two relational nouns to make the relation they have in common explicit. The whole derivation of reciprocal conjunction is triggered by the fact that the meanings of relational nouns in question are nearly inverse. In other words, the lexical restrictions on reciprocal interpretation motivate *inv* as a special kind of adjustment operator.

Furthermore, the interpretation outlined above ('a pair of people connected by the relation that is common to both nouns') is very close to what Eschenbach (1993) proposes for reciprocal plural relational nouns like *sisters*, *colleagues* etc. She argues that such expressions denote sets of people connected by relations in question. Krifka (1991) proposes a similar analysis of strongly reciprocal verbs like *meet*.

It is also worth noticing that Strawson-inverseness is predictable on the basis of lexical properties of relational nouns that has been argued to be relevant for the realization of their arguments in possessive construction.

Barker and Dowty (1993) suggest that the properties of nominal arguments that are responsible for their realization as either referents or correlates of relational nouns can be formulated in terms of nominal proto-roles. The nominal proto-roles they propose are **proto-part** and **proto-whole**. The nominal argument that is closer to proto-part is predicted to be realized as the referent and the argument that is closer to proto-whole is predicted to be realized as the correlate. Proto-part and proto-whole are defined as follows:

(24) a. *Proto-part entailments*:

- located at or defines a boundary of the other relatum
- is a property of the other relatum

b. *Proto-whole entailments*:

- entirely contains the other relatum as a proper part
- is a concrete entity

In addition to predictions about nominal arguments realization, the theory of Barker and Dowty also makes certain predictions about the organization of the lexicon in the sphere of relational nouns. Barker and Dowty claim that if two places of a relation R are asymmetric in terms of proto-roles this relation is likely to be lexicalized as one relational noun. However, if none of the arguments of relation R has more proto-part/proto-whole properties, such a relation is predicted to be lexicalized as two relational nouns that differ only in the order of arguments.

For instance, as the two siblings are not asymmetric in terms of proto-part/proto-whole, the siblinghood relation is predicted to be realized by two relational nouns denoting the inverse relations. Barker and Dowty assume that the nouns *brother* and *sister* confirm this prediction. They notice that the two nouns are not, strictly speaking, inverse but claim that they are *nearly inverse*.

Our findings can easily be correlated with the findings of Barker in Dowty. First, the lexical properties of relational nouns responsible for argument realization seem to predict which pairs of nouns will be Strawson-inverse. Second, our use of Strawson-inverseness can be used to make the claim of Barker and Dowty about nearly inverse relations more precise. In fact, nearly inverse relations are always Strawson-inverse.

By now we have seen that the lexical restrictions on reciprocal interpretation can be formulated in terms of Strawson-inverseness. The inverseness of relational nouns triggers the derivation of reciprocal conjunction. Furthermore, I have argued that the important and independently needed properties of relational nouns such as the properties of their arguments with respect to nominal proto-roles predict the Strawson-inverseness. Strawson-inverseness in its turn is a more precise formulation of the intuitions of Barker and Dowty about near inverseness.

One more issue that I would like to address here is connected with the status of reciprocal and intersective conjunction. In model M depicted in (18) the sentence (9) repeated here as (25) can be even three-ways ambiguous.

(25) *John invited an uncle and nephew to the party.*

*Uncle and nephew* here can mean two people who are uncle and nephew of each other, two people who are John's uncle and nephew and one person who is both John's uncle and John's nephew.

However, such situations are marginal and I do not think they undermine my claim that the reciprocal conjunction is a variant of intersective conjunction. It is just that in some rare cases both variants can apply.

Furthermore, I think the fact that reciprocal conjunction and intersective conjunction are nearly in complementary distribution is motivated by the econo-

my principle. To be more precise, the economy principle explains why most of the pairs of relational nouns denoting inverse (more precisely Strawson-inverse) relations have disjoint denotations. The situation (18) is anomalous because in this situation one person can be named both *uncle* and *nephew* of John. But the economy principle disfavors using two words for two places of an absolutely symmetric or nearly symmetric relation. Hence for most of the inverse relational nouns in natural language we are expecting not to encounter such situations as (18) violating the economy principle.

## 5. Conclusion

I have analyzed the semantics of relational nouns in coordination construction in Russian and English and compared it to the semantic behavior of sortal nouns. I have demonstrated that there is one kind of conjunction that is specific to relational nouns, namely the reciprocal conjunction. I propose to derive the reciprocal interpretation in 3 steps essentially including the intersective conjunction schema.

The proposed derivation is in fact triggered by the lexical properties of nouns that can be conjoined reciprocally. Those nouns are Strawson-inverse and hence they need only a tiny adjustment to make the reciprocal meaning available.

The lexical restrictions I formulate are predictable from the properties of the arguments of relational nouns in terms of proto-roles (Barker and Dowty 1993). Finally, the lexical restrictions on the reciprocal interpretation together with the economy principle explain the tendency for reciprocally conjoined pairs of relational nouns to have disjoint denotations (and not to be able to be conjoined intersectively).

The presence of reciprocal interpretation has some important consequences for the theories of coordination semantics. In section 2, I have argued that the ambiguity of examples like (9) (repeated above as (25)) seems to disfavor the unified treatments of *and* as having just one meaning. The unified analysis of Winter (2001) does not handle the cases of split reading. The unified approach of Heycock and Zamparelli (2005) cannot be straightforwardly generalized to cover relational nouns. However, additional work is needed to establish the claim that *and* has universally two meanings.

There are several other directions in which the results of this work can be developed. First of all, a more detailed comparison of reciprocal interpretation in conjoined relational nouns and plural relational nouns (Eschenbach 1993) suggests itself. Another case that has not been analyzed so far to my knowledge is the reciprocal comitative like *muž s ženouj* (literally *husband with wife*, in English rather *husband with his wife*). Possibly, my analysis can be also extended to the

case of verbal reciprocals like Russian morpheme *-s'a*. All these extensions will be a good topic of future research.

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## Ordinary property and identifying property wh-words: two *kakoj*-s in Russian\*

### 1. Introduction

As is well known, Russian has many different series of indefinite pronouns. Each series is formed via adding the marker of the series to the pronoun root, which is homonymous with the Russian wh-words.

- (1) a. WH-ROOT + MARKER = INDEFINITE PRONOUN  
 b. *kto* “who” + *-to* = *kto-to* “someone”  
 c. *kto* “who” + *bog znaet* “God knows” = *bog znaet kto* “God knows who”  
 d. *kto* “who” + *-libo* = *kto-libo* “anyone”

This paper examines a small subset of such pronouns, namely, the pronouns of the two series *-to* and *-nibud'* with the root *kakoj* “which/what”. The effect of adding one of these two markers to the wh-root is roughly equivalent to that of English *some* in *someone*, *somewhere*, etc.

- (2) a. *kto* “who” + *-to* = *kto-to* “someone”  
*kto* + *-nibud'* = *kto-nibud'* “someone”  
 ≅ “some person”  
 b. *gde* “where” + *-to* = *gde-to* “somewhere”  
*gde* + *-nibud'* = *gde-nibud'* “somewhere”  
 ≅ “some place”  
 c. *kakoj* “what/which” + *-to* = *kakoj-to* “some”?  
*kakoj* + *-nibud'* = *kakoj-nibud'* “some”?  
 ≅ “some property”?

Given (2a-b), one would expect *kakoj-to* and *kakoj-nibud'* to be a normal adjective and mean roughly “some property”, yet such a meaning was not attested in the literature; instead, these two pronouns were essentially treated as

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\* Many thanks to the audiences at FSIM 2 and FDSL 6.5, especially to Mati Reinovich Pentus, and to the two anonymous reviewers for FDSL 6.5, without whom this paper would be much worse than it is. Of course, the responsibility for all errors is my own. This work was partly supported by the National Science Foundation under Grant No. BCS-0418311 to B.H. Partee and V. Borschev, which is gratefully acknowledged.

determiners, akin to the English *some*. Nothing corresponded to the adjective wh-root in the resulting meanings.

In the rest of the paper, I try to explain this and related puzzles of *kakoj*-based pronouns and to provide such meaning(s) for *kakoj* which will allow us to derive the right semantics for examples containing such pronouns in a compositional manner. Section 2 reviews the data about *-to*, *-nibud'*, and *kakoj* and discusses several possible analyses, all of them imperfect. Section 3 presents the main idea of the paper: the *kakoj* pronoun is ambiguous between two variants, a question word for regular properties, and a question word for identifying properties. Section 4 shows how this idea helps to get the right meanings for *kakoj-to* and *kakoj-nibud'* examples. Finally, section 5 provides an additional argument in favor of the “two *kakoj* theory”.

## 2. Russian *-to* and *-nibud'* and the problem of *kakoj*-based pronouns

It is uncontroversial that the import of *-to* and *-nibud'* markers is somehow “related to” reference, and that the semantics of these markers is roughly analogous to that of the English indefinite determiner “some”:

- (3) *Kto-to* *prišel.*  
**who-TO** came  
 “Someone came.”

With *-to* added, “who” becomes “someone”. A series marker may in principle carry a very different semantics, cf. the “many” marker *mnogo* in (4) and the negative concord marker *ni* in (5):

- (4) *Mnogo* *kto* *prišel.*  
**Many who** came  
 “Many (people) came.”

- (5) *Nikto* *ne* *prišel.*  
**NEG-who** not came  
 “No one came.”

The difference between the *-to* and *-nibud'* markers is that the latter needs a licenser. Thus when a licenser, e.g., a *-nibud'*-licensing intentional verb *xotet'* “want” in (6), is present, the two are roughly synonymous. However, when there is no licenser, as in (7), only *-to* pronouns are grammatical.

- (6) a. *Petja xočet, čtoby kto-to prišel.*  
 Petja wants that **who-TO** came  
 “Petja wants that someone came.”
- b. *Petja xočet, čtoby kto-nibud’ prišel.*  
 Petja wants that **who-NIBUD** came  
 “Petja wants that someone came.”
- (7) a. *Kto-to prišel.*  
**who-TO** came  
 “Someone came.”
- b. *\*Kto-nibud’ prišel.*  
**who-NIBUD** came  
 “Someone came.”

The class of *-nibud’* licensers include quantificational DPs (*každyj mal’čik* “every boy”), quantificational adverbs (*inogda* “sometimes”), future, tense, intensional verbs (*xotet’* “want”), *if*-clauses, etc. (see, e.g., Padučeva (1985) for a comprehensive list). As Yanovich (2005) argues, the class of licensers is formed by all quantificational expressions of Russian, be they quantifiers over individuals, events, or worlds. Such an analysis requires certain non-trivial assumptions about the semantics of many constructions licensing *-nibud’*; i.e., imperatives, requests and purpose infinitives should be analyzed as containing a quantifier over possible worlds; the meanings of yes-no questions must contain one also. However, such choices do not seem too unnatural in view that the semantics of request-like constructions resemble that of the future tense, which is inherently modal, and that the semantics of questions, under Groenendijk and Stokhof (1984) is a partition of a set of possible worlds, which may be represented by “for each *w*’ in *W*, *w*’ is in one of the sets the question defines”. On the other hand, the payoff is too good to reject – at least, while we do not have any better analysis, since the hypothesis that *-nibud’* is licensed by quantificational structures is the first one ever to explain its distribution uniformly<sup>1</sup>.

1 An anonymous reviewer suggests that *-nibud’* may be decomposed into a full relative clause akin to *by to ni bylo* series marker, and that its licensing conditions may be derived from the counterfactuality of this decomposed relative. Unfortunately, this does not seem to be possible: the licensing conditions of *by to ni bylo* and *-nibud’* are different, and that alone seems to undermine the enterprise. Cf. (i), where *by to ni bylo* may not be changed to *-nibud’* (example (i): S. Lavrov, Russian Minister of Foreign Affairs):

(i) a. *Posredničestvo so storony OBSE ili kogo by to ni bylo*  
 Mediation by OSCE or anyone else  
*v otnošenijax Rossii i Gruzii ne trebujetsja.*  
 in the relationships between Russia and Georgia is not needed

Another important property of *-nibud'* pronouns is their inability to scope over their licenser (or, when there are many possible licensers, over the highest of them):

- (8) *Každyj mal'čik<sub>i</sub> budet rad esli Ø<sub>i</sub> vstretit*  
 Every boy<sub>i</sub> will be glad if [he<sub>i</sub>] will meet  
*kogo-nibud' iz svoix odnoklassnic.*  
**who-NIBUD** of the girls in his class

“Every boy will rejoice if he meets someone of his female classmates.”

- Wide: \*  $\exists > \forall > \text{if}$   
 Intermediate: <sup>OK</sup>  $\forall > \exists > \text{if}$   
 Narrow: <sup>OK</sup>  $\forall > \text{if} > \exists$

“Traditional” accounts, such as Dahl (1970) and Padučeva (1985), capture this effect in some way or other, e.g., introducing filters on possible scope configurations for sentences containing *-nibud'* pronouns, or stating restrictions to the effect that *-nibud'* pronouns may be used only in certain environments (that is, in the scope of their licensers). I will not discuss the overall adequacy and explanatory power of such accounts here. For the current discussion, it is important that whatever means one uses to predict the scope properties of *-to* and *-nibud'*, there is a problem of how to derive compositionally the meanings for *kakoj*-pronouns. There is a wide agreement in the literature that the meanings for (9) look like those in (10):

- (9) a. *Každaja devočka uvidela kakogo-to kotenka.*  
 Every girl saw **which-TO** kitten.  
 “Every girl saw some kitten.”  
 b. *Každaja devočka uvidela kakogo-nibud' kotenka.*  
 Every girl saw **which-NIBUD** kitten.  
 “Every girl saw some kitten.”

- (10) a. Wide-scope reading, OK for (9a) only<sup>2</sup>:  
 $\exists \mathbf{x}: \text{kitten}(\mathbf{x}) \ \& \ \forall y: \text{girl}(y) \Rightarrow (\text{saw}(\mathbf{x})(y))$   
 b. Narrow-scope reading, OK for (9a,b):  
 $\forall y: \text{girl}(y) \Rightarrow \exists \mathbf{x}: \text{kitten}(\mathbf{x}) \ \& \ (\text{saw}(\mathbf{x})(y))$

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b. \* *Posredničestvo so storony OBSE ili kogo-nibud' v otnošenijax Rossii i Gruzii ne trebujetsja.*

2 *-to* pronouns may have the widest scope and *-nibud'* pronouns may not. Both series may have non-widest scope, though some scope construals may be more easily constructed with one of them, depending on the context, with *-nibud'* in general favoring local scope construals.

The problem is that to derive (10), we must accept that the interpretational import of the whole *kakoj*-based pronoun is equal to the import of the series marker in all other pronouns, that is, to accept that the *kakoj* root is semantically vacuous. For instance, in (10a), the restricting predicate *kitten(x)* is contributed by the common noun, and the contribution of the pronoun *kakoj-to* is just the existential quantifier. However, this contribution equals to that of the series marker *-to* in the other pronouns of the series, cf. (11).

(11) *Každaja devočka uvidela kogo-to.*

Every girl saw who-TO.

a. Wide-scope reading:

$\exists \mathbf{x}: \text{human}(\mathbf{x}) \ \& \ \forall y: \text{girl}(y) \Rightarrow (\text{saw}(\mathbf{x})(y))$

b. Narrow-scope reading:

$\forall y: \text{girl}(y) \Rightarrow \exists \mathbf{x}: \text{human}(\mathbf{x}) \ \& \ (\text{saw}(\mathbf{x})(y))$

The same is true for the *kakoj-nibud'* pronoun; cf. the following description of the meaning of *kakoj-nibud'* by Padučeva (2004): "... a pronoun of the *kakoj-nibud'* type expresses an existential quantifier in the context of an embedding operator" (translation by IY). But just the affix *-nibud'* does the same thing!

A more up-to-date analogue of (10) would involve choice functions (cf. Reinhart (1997), Kratzer (1998)) rather than existential quantifiers: as was argued by Yanovich (2005), a choice-functional analysis of *-to* and *-nibud'* pronouns fits well with their interpretational properties. Yanovich (2005) proposes a theory that allows to account for the scope properties of these pronouns and builds their meanings compositionally from the meanings of the pronoun root and the series marker. The main idea is that *-to* and *-nibud'* denote choice functions (or, more accurately, generalized Hamblin choice functions<sup>3</sup>) in the style of Kratzer (1998). While *-to* denotes a simple choice function, *-nibud'* denotes a choice function skolemized for one argument. This argument needs to be bound by a quantificational expression, and that explains, first, why the class of *-nibud'* licensers coincides with the class of quantificational expressions, and secondly, why *-nibud'* has to scope under the highest of its licensers – it follows

3 Standard choice functions are in type  $\langle\langle \text{et} \rangle, e \rangle$  and choose an individual from a set of individuals. Yanovich (2005) defines a class of generalized choice functions of polymorphic type  $\langle\langle \alpha t \rangle, \alpha \rangle$ ,  $\alpha$  a variable over types. Generalized choice functions choose an object of type  $\alpha$  from a set of such objects. (Generalized) Hamblin choice functions, also defined by Yanovich (2005), differ from simple generalized choice functions in that they take as their argument a Hamblin set of alternatives of type  $\alpha$  rather than a usual set. Throughout this paper, we will use the usual  $\{ \}$  set notation to refer to Hamblin alternative sets.

from the way skolemized choice functions behave. Another welcome result is that the Kratzerian choice-functional account explains why *-to* and *-nibud'* pronouns cannot scope in the immediate scope of negation.

Yanovich (2005) builds the meanings for *kakoj*-based pronouns in the same way as the meanings for other pronouns in the pronoun series. As a result, they are not identical to the meanings of *-to* and *-nibud'* alone, and contain the adjective meaning of the *kakoj* root. So the meanings for (9) derived by Yanovich (2005) are different from those assigned to (9) by earlier accounts<sup>4</sup>:

(12) a. Wide-scope reading, OK for (9a):

[ $\exists x$ : kitten(x) &]  $\forall y$ : girl(y)  $\Rightarrow$   
 [ $\exists x$ : kitten(x) &] kitten(x) & **f**( $\{p: p \in \langle e, t \rangle\}$ )(x) & saw(x)(y),  
 f a generalized Hamblin choice function.

b. Narrow-scope reading, OK for (9a,b):

[ $\exists x$ : kitten(x) &]  $\forall y$ : girl(y)  $\Rightarrow$   
 [ $\exists x$ : kitten(x) &] **f**(y)( $\{p: p \in \langle e, t \rangle\}$ )(x) & saw(x)(y),  
 f a generalized Hamblin choice function.

While the traditional wide-scope meaning in (10a) states that there is a kitten such that every girl saw it, the meaning in (12a) says the context supplies a choice function **f** choosing from the Hamblin set of all properties some property *P*, and that this *P* is true of a kitten *x*. This means that for (12a) to be true **f** should choose some property *P* true of the kitten every girl saw. Imagine the following scenario: every girl see a (possibly different) red kitten; if **f** chooses the property of being red, then (12a) is true in this scenario, since all kittens seen by every girl share the same property of being red. Under the wide-scope (12a), the choice function chooses the same property for all cases of girls seeing kittens. Under the narrow-scope (12b), the choice function chooses a different property for every girl.

It should be clear now that the meanings assigned to (9) by Yanovich (2005) are very different from the traditionally accepted meanings: the former are about existence (or choice) of individuals, the latter about existence (or choice) of properties. If we would just transform the meanings in (10) into their choice-functional counterparts, we would get (13) instead of (12):

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4 Under the standard assumptions about scoping of indefinite DPs, the variable corresponding to the “kitten” DP may be existentially closed either above or below the universal quantifier, resulting in two different meanings. To save space, I abbreviate these two possibilities by [ $\exists x$ : kitten(x) &]; it is meant that the expression in brackets should be read only once, either in the wide scope position or in the narrow scope one.

(13) a. Wide-scope reading, OK for (9a) only:

$\forall y: \text{girl}(y) \Rightarrow \text{saw}(\mathbf{f}(\mathbf{kitten}))(y),$  f a choice function

b. Narrow-scope (skolemized) reading, OK for (9a,b):

$\forall y: \text{girl}(y) \Rightarrow \text{saw}(\mathbf{f}(y)(\mathbf{kitten}))(y),$  f a choice function

The meanings in (13) are roughly equivalent to the meanings in (10), except for the differences following from the choice of existential quantifiers or choice functions. And again, if we compare (13) with (14), the choice-functional counterpart of the meaning in example (11), containing *kto-to* “someone”, we can see that the contribution of indefinite pronouns with *kakoj* roots in (13) is the same as the contribution of the series markers, as if the root is semantically vacuous.

(14) a. Wide-scope reading:

$\forall y: \text{girl}(y) \text{ saw}(\mathbf{f}(\mathbf{human}))(y),$  f a choice function

b. Narrow-scope reading:

$\forall y: \text{girl}(y) \text{ saw}(\mathbf{f}(y)(\mathbf{human}))(y),$  f a choice function

So there are two kinds of meanings assigned to (9): first, we have meanings talking about existence of individuals – in case of (9), individual kittens. (10) and (13) belong to this class. Secondly, there are meanings talking about existence of properties, as those in (12). Since their truth conditions are very different, it seems to be easy to check which meanings fit the speakers’ intuitions better.

The speakers do choose the first kind as the right meanings. Thus, while Yanovich’s (2005) meanings of the second kind, in (12), not losing the meaning of the *kakoj* root, are not consistent with the basic intuitions – the speakers seem to prefer the meanings where this pronoun root does not contribute anything to the semantics. Or, at least, it is so at first sight. Actually, the pattern of judgments is more complicated: most speakers accept that (9) may have only the meaning as in (10) or (13), but there are also some who allow for both (10)/(13)-type meanings and (12)-type ones. However, even for those speakers the first kind of meanings is definitely more natural.

At this point, we have two alternatives. First, we may adopt the traditional analysis of *kakoj-to* and *kakoj-nibud’* under which the pronoun root contributes nothing to the meaning of the sentence. This way we may derive the meanings in (10) or (13) that the speakers do accept. Secondly, we may try to modify Yanovich’s (2005) theory – or any other theory which builds *kakoj*-based pronouns compositionally – to allow it to make the right predictions somehow. In what follows, we try to pursue the latter option.

Before proceeding, it would be useful to discuss if a more complicated analysis generating the meanings in (10) (or (13)) as basic is possible. An

anonymous reviewer for this volume argues that there is a conceivable simple analysis of the facts above. Such an analysis would state that the series markers in examples with *kakoj-to* and *kakoj-nibud'* on the surface are actually attached to the DP itself, not to the indefinite pronoun; then some movement brings about the linearization in which the series marker follows the pronoun. It may be either that the series marker attaches to the NP projection and a rightward movement of NP leaves it linearly adjacent to  $D^0$ , occupied by the pronoun, or that the marker is attached at the DP level, then *kakoj* undergoes a leftward movement (e.g., to  $D^0$ ), and then some rule of clitic placement takes care of the linearization of the [marker + *kakoj*] complex as “*kakoj*-marker”.

Firstly, it should be noted that the problem outlined above is not solved by such an analysis: the contribution of *kakoj* remains vacuous. If so, then why *kakoj* is used at all – why the marker cannot be attached to a DP without a wh-based pronoun at all (and also why *kakoj*, and not some other pronoun, must be used as a vacuous clitic host)?

Secondly, the existence of true property readings of *kakoj*-based pronouns, as in (12), is a problem for such an account. The most viable solution which I can see at the moment is to suggest that *-to* can be adjoined either to the whole DP, producing the interpretations in (10)/(13), or to the pronoun itself, generating (12). With this addition, the alternative analysis may no longer be called simple: all things being equal, such structural ambiguity is no better than the lexical ambiguity proposed in what follows.

Finally, there is substantial empirical evidence that *kakoj*-based indefinite pronouns are base-generated lexical items, not a result of movement of the marker to a position linearly adjacent to the pronoun root. As (15) shows, *kakoj*-based pronouns may occupy both above-NumP and below-NumP positions. Under the rightward movement hypothesis, (16a), in (15a) *-to* adjoins to NumP (or some projection above it), and it is NumP which is moved rightward; in (15b), *-to* is adjoined below NumP, and it is NP, not NumP, which is moved. It is not by itself bad to have such a big choice of possible adjunction site for series markers, but if we have both possibilities, why then (17a), derived with the assumptions used in (16a), is not attested? Under the hypothesis that *kakoj* undergoes leftward movement, we face the same problem: the landing site for *kakoj* must be above NumP for (15a) and below NumP for (15b), and similarly the series marker must sit somewhere above NumP in (15a) and below NumP in (15b). Again, this predicts the unattested order, (17b).

- |      |    |                 |                 |                 |
|------|----|-----------------|-----------------|-----------------|
| (15) | a. | <i>Kakie-to</i> | <i>tri</i>      | <i>mal'čika</i> |
|      |    | Some            | three           | boys            |
|      | b. | <i>Tri</i>      | <i>kakix-to</i> | <i>mal'čika</i> |
|      |    | Three           | some            | boys            |

- (16) a. Rightward movement:  
 $[_{DP}[_{DP} \textit{Kakie} [_{NumP} \textit{to} t_i ] ] [_{NumP} \textit{tri mal}'\check{c}ika]_i]$ ,  
 or  $[_{DP}[_{DP} \textit{Kakie} [_{NumP} \textit{to tri} t_i ] ] [_{NP} \textit{tri mal}'\check{c}ika]_i]$ ;  
 $[_{NumP} \textit{Tri} [ \textit{kakix} [_{NP} \textit{to} t_i ] ] [_{NP} \textit{mal}'\check{c}ika]_i]$ .  
 b. Leftward movement:  
 $[_{DP} [ \textit{Kakie} ]_i \textit{to} [_{NumP} (t_i) \textit{tri} (t_i) \textit{mal}'\check{c}ika] ]$ ;  
 $[_{NumP} \textit{Tri} [ [ \textit{kakix} ]_i \textit{to} [_{NP} t_i \textit{mal}'\check{c}ika] ] ]$ .
- (17) a. Rightward movement:  
 $*[_{DP}[_{DP} \textit{Kakie} [_{NumP} \textit{tri} [_{NP} \textit{to} t_i ] ] ] [_{NP} \textit{mal}'\check{c}ika]_i]$   
 b. Leftward movement:  
 $*[_{DP} [ \textit{Kakie} ]_i [_{NumP} \textit{tri} [ \textit{to} [_{NP} t_i \textit{mal}'\check{c}ika] ] ] ]$

Another empirical argument to the same point is the absence of *kotoryj*-based indefinite pronouns. If *kakoj*-based pronouns are not genuine lexical items coming from the lexicon, then we expect to find also *kotoryj*-based pronouns: while *kotoryj* “which” as a *wh*-pronoun is slowly dying away in Russian, it is still acceptable, though less frequent than *kakoj*. However, DPs such as *kotoryj-to mal'čik* are absolutely ungrammatical. If *kakoj*-based pronouns are lexical items, this may be easily explained: lexicon is known to allow “gaps” such as the absence of *kotoryj*-based pronouns.

To sum up, the challenge of *kakoj*-pronouns consists of two parts: firstly, we need to explain how the meanings in (10) or (13) can be compositionally derived without assuming that *kakoj* is semantically vacuous, and secondly, how both the meanings in (10)/(13) and in (12) can be accepted as the right meanings for (9).

### 3. The proposal: two *kakoj*-s

As expected, since my proposal is based on the choice-functional analysis of *-to* and *-nibud'*, it will not allow to derive the existential meanings in (10), but it will allow to derive meanings equivalent to the choice-functional (13). The main idea is that there are two *kakoj* roots, one ranging over normal properties, and another ranging over the identifying properties, that is, such properties which hold of exactly one individual. I illustrate the difference using for concreteness a Karttunen-style analysis of questions which states that a question denotes a set of all its true answers, Karttunen (1977):

- (18)  $[[\textit{kakoj}_1]] = \{P_{\langle et \rangle}\}$  – the set of all properties

- (19)  $[[kakoj_2]] = \{P_{\langle et \rangle} \mid \exists x: P(x) \ \& \ (\neg \exists y: P(y) \ \& \ x \neq y)\}^5$   
 – the set of all identifying properties

Using these meanings, we can derive the following:

- (20) a. *Kakuju knigu ty čitaješ?*  
 “What/Which book [do] you read?”  
 b. *Kakoj<sub>1</sub>* meaning:  
 $\{P_{\langle et \rangle} \mid \exists z: \text{book}(z) \ \& \ \text{read}(z)(\text{you}) \ \& \ P(z)\}$   
 c. *Kakoj<sub>2</sub>* meaning:  
 $\{P_{\langle et \rangle} \mid \exists x: P(x) \ \& \ (\neg \exists y: P(y) \ \& \ x \neq y) \ \& \ \exists z: \text{book}(z) \ \& \ \text{read}(z)(\text{you}) \ \& \ P(z)\}$

A question with *kakoj<sub>1</sub>* denotes the set of all properties the book that the addressee reads has. A question with *kakoj<sub>2</sub>* is only about those properties that uniquely identify this book. The first question may be answered with a property like “interesting” which, in most cases, would be true of many books. The second question may be answered only with a property uniquely identifying the book read in the current situation. E.g., “lying on the addressee’s table” may be such a property, if there is only one book lying on her or his table.

Importantly, while both meanings are in the adjective type, the latter may create the illusion of a determiner meaning, because providing the answer containing an identifying property – the adjective-type meaning – also allows the hearer to make inference about the individual of which that property holds.

In other words, we expect *kakoj<sub>2</sub>* to perform the semantic role closer to that of a question determiner rather than of a question adjective. Thus the pair *kakoj<sub>1</sub> – kakoj<sub>2</sub>* is similar to the pairs *what – which* (English), *donna – dono*

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5 It may be advantageous to formulate a  $\langle\langle et \rangle, \langle et \rangle\rangle$ -type meaning for *kakoj<sub>2</sub>* instead of the intersective  $\langle et \rangle$  meaning in (14).

(i)  $[[kakoj_2]] = \lambda p_{\langle et \rangle}. \{q \in \langle\langle et \rangle, \langle et \rangle\rangle \mid \exists x: q(p)(x) \ \& \ (\neg \exists y: q(p)(y) \ \& \ x \neq y)\}$ .  
 (i) ensures that the predicate corresponding to the whole common noun phrase is identifying, not just the predicate corresponding to the adjective itself. For instance, in the red dress example below, such a meaning will require the predicate “red dress” be identifying instead of requiring the predicate “red” to be so. Thus it will be possible for “red” to be used in response to *kakoj<sub>2</sub>* even if there are other red objects in the situation, as long as these objects are not dresses. Since every intersective adjective may be type-shifted to type  $\langle\langle et \rangle, \langle et \rangle\rangle$ , every adjective will be able to serve as an answer to a question to an identifying property, whatever our assumptions about types for adjectives are. Nothing in what follows hinges crucially on the choice of  $\langle et \rangle$  or  $\langle\langle et \rangle, \langle et \rangle\rangle$ .

(Japanese), etc., where the first member “demands” a property, and the second member, an individual.<sup>6</sup>

#### 4. Deriving the right meanings for examples with *kakoj-to* and *kakoj-nibud'*

To make the rest of the paper more readable, I define the set of identifying functions of type  $\langle \alpha t \rangle$  as  $\text{IDENT}_\alpha$ . Thus,  $\text{IDENT}_e$  is the set of identifying functions of type  $\langle e, t \rangle$ .

$$(21) \text{IDENT}_\alpha =^{\text{def}} \{P_{\langle \alpha t \rangle}: \exists x_\alpha P(x) \ \& \ (\neg \exists y P(y) \ \& \ x \neq y)\}$$

The meanings for a *kakoj*<sub>2</sub>-based pronoun and a DP containing it will look as follows:

$$(22) \begin{aligned} [[\textit{kakoj}_2]] &= \text{IDENT}_e \\ [[\textit{to}]] &= \lambda P.f(P), \\ &\text{P set of alternatives, f a generalized Hamblin choice function} \\ [[\textit{kakoj}_2\textit{-to}]]_{\langle et \rangle} &= f(\text{IDENT}_e) \\ [[\textit{kakoj}_2\textit{-to mal}'\textit{čik}]]_{\langle et \rangle} &= \lambda x.f(\text{IDENT}_e)(x) \ \& \ \text{boy}(x), \\ &\text{f a generalized choice function} \end{aligned}$$

Thus the meaning of *kakoj*<sub>2</sub>-*to mal'čik* is a predicate which is true of all individuals who are boys, and of which an identifying property chosen by a Hamblin choice function **f** (supplied by the context) holds. This meaning is of the NP type  $\langle et \rangle$ , not of the DP types  $e$  or  $\langle \langle et \rangle, t \rangle$ , and existential closure must be applied to get a normal argument meaning. After existential closure is applied,

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6 Several interesting questions arise from this analogy. For instance, what if *which*, usually analyzed as a determiner, is actually an adjective, like the Russian *kakoj*<sub>2</sub>? Then the difference between *what* and *which* will be that of the meaning, not of the syntactic category. Moreover, if *which* indeed has a meaning analogous to the meaning for *kakoj*<sub>2</sub> in (19), may it be that identifying properties in the meaning of a wh-word somehow represent the semantic correlate of D-linking? Most properties may not be judged as identifying without the context (unless their identifying nature is built into their definitions), hence *kakoj*<sub>2</sub> has to range over some set of contextually salient identifying properties. Since these properties are identifying, each of them corresponds to some individual chosen by that property, and a set of such individuals is a set of objects from which the person answering the question must choose one object – but this closely corresponds to the semantics of D-linking.

Cf. Pesetsky (2000) defining D-linked wh-phrases as wh-phrases requiring answers in which “the individuals that replace the wh-phrases are drawn from a set that is presumed to be salient both to speaker and hearer”.

the “wide-scope” reading derived with *kakoj*<sub>2</sub> for (9a), repeated below as (23), will look like (24), and the “narrow-scope” reading, like (25)<sup>7</sup>:

(23) *Každaja devočka uvidela kakogo-to kotenka.*

Every girl saw which-TO kitten.

(24) Our new *kakoj*<sub>2</sub> “wide-scope” meaning for (23):

a.  $\exists x: \text{kitten}(x) \ \& \ (\text{f}(\text{IDENT}_e))(x) \ \& \ \forall y: \text{girl}(y) \Rightarrow \text{saw}(x)(y)$

b.  $\forall y: \text{girl}(y) \Rightarrow \exists x: \text{kitten}(x) \ \& \ (\text{f}(\text{IDENT}_e))(x) \ \& \ \text{saw}(x)(y)$

(25) Our new *kakoj*<sub>2</sub> “narrow-scope” meaning for (23):

a.  $\exists x: \text{kitten}(x) \ \& \ (\text{f}(\text{IDENT}_e)(y))(x) \ \& \ \forall y: \text{girl}(y) \Rightarrow \text{saw}(x)(y)$

b.  $\forall y: \text{girl}(y) \Rightarrow \exists x: \text{kitten}(x) \ \& \ \text{f}(\text{IDENT}_e)(y)(x) \ \& \ \text{saw}(x)(y)$

While there are two possible sites for existential closure in our “wide-scope” reading, (24a,b), it is easy to show that it does not matter at all where the indefinite DP scopes. Even if it scopes under  $\forall$ , (24b),  $\text{f}(\text{IDENT}_e)$  may choose only one property, and this property is true of only one individual. Hence it follows that every girl saw the same kitten even under the narrow scope of  $\exists$ . So we will not distinguish (24a) and (24b) in what follows. As for the “narrow-scope” reading in (25), in this case the wide-scope construal in (25a) is ruled out by the Weak Crossover constraint, since the variable  $y$  in the restrictor of the indefinite DP is brought by movement (or some equivalent scope-changing operation) out of the scope of the universal quantifier which should bind it.

Our next step is to demonstrate that all subformulas containing an identifying property  $\text{f}(\text{IDENT}_e)$  may be replaced with subformulas containing a usual choice function  $g$ , defined in terms of  $f$  (so if the context supplies  $f$ , it also supplies  $g$ ):

(26)  $\text{f}(\text{IDENT}_e)(x) \ \& \ P(x) \iff (x = g(P)) \ \& \ \text{CH}(g)$ ,

where  $f$  is a generalized choice function,

$\text{CH}$  is a property of being a (usual) choice function,

$g = \lambda Q. \iota y. \text{f}(\text{IDENT})(y)$ .

Though the argument  $Q$  is not mentioned in the definition of  $g$ , and thus the individual that  $g$  chooses does not depend on the argument set, the condition  $\text{CH}(g)$  requires that the individual chosen by  $g$  be a member of the argument set.

Let us check whether the left part entails the right part.  $\text{f}(\text{IDENT}_e)$  denotes an identifying property which uniquely determines some individual  $z$ . If  $x$  is such an individual, that is, if  $(x = z)$ , and if  $P$ , the property denoted by the rest of

7 I use the standard by now assumption that the lexical material in the indefinite DP should be placed at the composition level where existential closure applies.

the restrictor of the DP, holds of  $x$ , then the left part is true. If this is the case, then  $\iota y.f(\text{IDENT}_e)(y) = z$ , and the right part may be rewritten as  $(x = \lambda Q.z) \& P(x)$ , both conjuncts of which are entailed by the left part. Entailment in the other direction is equally obvious. Since  $x = \iota y.f(\text{IDENT}_e)(y)$ , by definition of  $g$ , it follows that  $f(\text{IDENT}_e)(x)=1$ . From  $x = g(P) \& \text{CH}(g)$  it follows that  $P(x)$ . Thus the left and right parts are equivalent.

Now we can reformulate the meanings in (24) and (25) using the choice function  $g$  instead of the expression  $f(\text{IDENT}_e)(x)$ .  $f$  is supplied by the context, and since we have defined  $g$  in terms of  $f$ , we can safely assume that  $g$  is supplied by the context as well.

(27) Wide scope, from (24):

- a.  $\exists x: (x = g(\text{kitten})) \& \text{CH}(g) \& \forall y: \text{girl}(y) \Rightarrow \text{saw}(x)(y)$
- b.  $\forall y: \text{girl}(y) \Rightarrow \exists x: (x = g(\text{kitten})) \& \text{CH}(g) \& \text{saw}(x)(y)$

(28) Narrow scope, from (25b):

- $\forall y: \text{girl}(y) \Rightarrow \exists x: (x = g(y)(\text{kitten})) \& \text{CH}(g) \& \text{saw}(x)(y)$

Leaving aside cases when  $f(\text{IDENT}_e)$  chooses an individual of which the rest of the DP's restrictor is false, we can further transform these formulas to even more usual choice-functional form, familiar from Kratzer (1998)<sup>8</sup>:

(29) Wide scope, from (27):

- $\forall y: \text{girl}(y) \Rightarrow \text{saw}(g(\text{kitten}))(y)$ ,  $g$  a choice function

(30) Narrow scope, from (28):

- $\forall y: \text{girl}(y) \Rightarrow \text{saw}(g(y)(\text{kitten}))(y)$ ,  $g$  a choice function

But the meanings in (29) and (30) are exactly the meanings in (13). Thus we were just able to get the meanings that speakers actually attribute to (9) without having to assume a vacuous meaning for the *kakoj* root.

Using the lexical ambiguity proposal from Section 3, we were able to reach our goal: we can derive both the meanings in (12) and in (13) compositionally. The meanings in (12) result if we use *kakoj*<sub>1</sub>, denoting the set of all properties; the meanings in (13) result if we use *kakoj*<sub>2</sub>, denoting the set of identifying properties. However, the meanings in (13) are derived in an indirect way, which does not force us to have a vacuous *kakoj*.

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8 (27a,b) have collapsed into the single (29), since the site of existential closure does not matter: even if  $\exists x$  has narrow scope,  $x = g(\text{kitten})$  ensures that  $x$  is the same for every girl  $y$ .

### 5. Appendix: one more argument in favor of non-vacuous *kakoj*

Remember the series marker *mnogo*, mentioned in Section 1:<sup>9</sup>

- (31) *Mnogo* *kto* *prišel*.  
Many **who** came  
 “Many (people) came.”

If we accept the vacuous semantics for the *kakoj* root, then we predict for (32) the meaning “many books”. However, (32) may not in fact mean “many books”, it means “books of many different sorts”.

- (32) *Mnogo* *kakie* *knigi*  
Many **which/what** books  
 “Books of many sorts”

Unlike the vacuous-*kakoj* analyses of *kakoj*-based pronouns, the approach described above predicts this meaning: it is easy to derive it using *kakoj*<sub>1</sub>. The reading corresponding to *kakoj*<sub>2</sub> may be argued to be absent because of the competition with the quantifier *mnogo* ‘many’, using which instead of *mnogo kakoj* results in a very similar meaning. Note that to derive the actual meaning of (32), any theory must accept that *kakoj* may have an adjective-type and non-vacuous meaning, which is not consistent with analyses for *kakoj-to* and *kakoj-nibud*’ assuming that the *kakoj* root is meaningless.

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9 It is important to note that the series marker *mnogo* is different from the quantifier *mnogo* “many”. The former is a morpheme which may only modify wh-pronoun roots and is not inflected; moreover, case is marked directly on the pronoun, as it is with wh-based other indefinite pronouns, the quantifier *mnogo* is a full lexical item, may be combined with any common noun and forces the special case pattern on the complement noun, e.g., when the whole *mnogo*-phrase is Nominative, the complement noun must be morphologically Genitive. Thanks to Steven Franks for pointing to me the importance of discussing this distinction.

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*Markéta Ziková*

## **Why are case markers in the Czech nominal declension not cyclic suffixes?\***

### **1. Introduction**

In this paper, I analyze the lexical representations of case markers in Czech and their merger with those nominal stems which end in consonants. My aim is to provide independent morphological evidence for empty Nuclei and lexically floating vowels, the phonological objects introduced in the Standard Government Phonology and developed in the CVCV framework (Lowenstamm 1996, Scheer 2004).

I assume that in the lexicon, all stem-final consonants are followed by empty Nuclei. On the basis of two alternations, an  $e \sim \emptyset$  alternation and alternations of syllabic liquids, I argue in favour of the following analyses: 1. Zero case markers have no phonological structure of their own. Their effect on the form of the stem arises from the empty Nucleus which stands at the end of the stem. 2. Marker-initial vowels are lexically specified to associate to the stem-final Nucleus. Their effect on the form of the stem follows from the full Nucleus which they create.

### **2. Vowel-zero alternations and liquid alternations**

In Czech nominal declension, there are two types of case markers: zero markers and suffixes beginning with vowels, both short and long. With respect to  $e \sim \emptyset$  alternations (in Czech, only the mid front vowel alternates with zero) and liquid alternations (in Czech, liquids [r] and [l], henceforth L, have syllabic and non-syllabic alternants), vowel-initial markers behave alike, in an opposite way to zero markers. This is illustrated in table (1).

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\* Thanks to Tobias Scheer for helpful comments.

- (1) Distribution of alternants:  $e \sim \emptyset$ ,  $L \sim L^1$

	positive marker		zero marker	
strong alternant: $e/L$			kotel- $\emptyset$ pater- $\emptyset$	trotl- $\emptyset$ bratr- $\emptyset$
weak alternant: $\emptyset/L$	kot $\emptyset$ l- $\text{ũ}$ pat $\emptyset$ r-em	trotl- $\text{ũ}$ bratr-em		

To sum up: 1. The weak alternant, i.e. a zero or a non-syllabic liquid, occurs when the stem-final consonant is immediately followed by a vowel-initial marker. 2. The strong alternant, i.e. an *e* or a syllabic liquid, occurs when the stem-final consonant is also word-final. In what follows, I submit a plausible (perhaps) explanation why these two categories of case markers produce such opposite effects on the stem.

### 3. Levels of representation

In this section, I explore representations of those phonological objects which are relevant to my analysis: final codas, vowels alternating with zero, and syllabic consonants.

#### 3.1. Final codas: Onsets of empty Nuclei

In CVCV, phonological structure is represented on two separate levels. The syllable level consists of a strict sequence of non-branching Onsets (i.e. consonantal constituents, C) and non-branching Nuclei (i.e. vocalic constituents, V), hence CVCV. The segmental level consists of phonological expressions which are considered to have a hierarchical structure as well. What is important is that CV units are the minimal building blocks (the existence of C implies the existence of V, and *vice versa*). There are three consequences of this: 1. The parts of all consonant clusters are separated by empty Nuclei. 2. All morpheme-final consonants are Onsets of empty Nuclei. 3. The syllable structure of all morphemes starts with an Onset (empty or full) and ends in a Nucleus (empty or full).

To illustrate these consequences, under (2), I give the representation of the nominative singular form [atlas] ‘atlas’. It consists of eight constituents, three of

1 Through this paper,  $\emptyset$  stands for the weak alternant and  $\emptyset$  for the zero case marker. Glosses: *kotel* ‘boiler, NomSg’, *pater* ‘floor, GenPl’, *trotl* ‘prune, NomSg’, *bratr* ‘brother, NomSg’, *kotlũ* ‘GenPl’, *patrem* ‘InsSg’, *trotlũ* ‘GenPl’, *bratrem* ‘InsSg’.

which are empty: it begins with an empty Onset and ends with an empty Nucleus, and an empty Nucleus separates two morpheme-internal consonants as well.

- (2) NomSg [atlas]: empty Onset & empty Nuclei

C	V	C	V	C	V	C	V
a	t			l	a	s	

### 3.2. V ~ ∅ alternations: Nuclei with floating vowels

CVCV assumes that the syllable structure is recorded in the lexicon, and then projected into the derivation. This is a phonological version of the syntactic Projection Principle.<sup>2</sup> From this principle it follows that Nuclei which host V ~ ∅ alternations are already present in the lexical representation. In CVCV, vowels alternating with zero are lexically floating segments. Their phonetic realization depends on whether they link to their Nucleus. By way of illustration, I show the lexical representation of the root  $\sqrt{\text{PATR}}$  ‘floor’, which features an alternation site between *t* and *r*.

- (3) Lexical representation of alternating *e*:  $\sqrt{\text{PATR}}$

C	V	C	V	C	V
p	a	t	ε	r	

Outside CVCV, V ~ ∅ alternations are analysed in two ways: the vowel is either epenthetic or present in the underlying structure, and then disappears. In absence of the Projection Principle (i.e. in case that the syllable structure is considered not to be projected from the lexical representation of particular morphemes, but to be derived in the phonological component), both of these strategies, epenthesis and deletion, lead to resyllabification. In that case, the final consonant of the root  $\sqrt{\text{PATR}}$  sits either in a Coda or in a branching Onset depending on whether the alternation site between *t* and *r* is vocalised (e.g. *pater* ‘floor, GenPl’) or not (e.g. *patro* ‘floor, NomSg’).

If alternating vowels are either inserted or deleted by rule, their distribution should be predictable. However, what is predictable is the distribution of alternants, but not the distribution of the alternation sites themselves. This can be illustrated by three roots:  $\sqrt{\text{PATR}}$  ‘floor’,  $\sqrt{\text{KATR}}$  ‘frame-saw’, and  $\sqrt{\text{CITER}}$

2 The phonological Projection Principle was originally formulated within the Standard Government Phonology; see e.g. Kaye et al. (1990).

‘cither’. If we adopt an epenthetic scenario, the root  $\sqrt{\text{KATR}}$  should behave in the same way as the root  $\sqrt{\text{PATR}}$  because in the underlying structure they both end in a *tr* cluster. In fact, they do not behave alike: in the context of a zero marker, the root  $\sqrt{\text{PATR}}$  shows the vowel *e*, but the root  $\sqrt{\text{KATR}}$  shows the syllabic liquid instead; compare *pater-Ø* ‘floor, GenPl’ and *katr-Ø* ‘frame-saw, NomSg’. From this it follows that information about epenthesis must be somehow encoded in the lexical representation. If we adopt the deletion scenario, the same problem arises. Even though the roots  $\sqrt{\text{PATR}}$  and  $\sqrt{\text{KATR}}$  will differ lexically, i.e.  $\sqrt{\text{PATER}}$  vs.  $\sqrt{\text{KATR}}$ , additional information about the alternating vowel is still needed to capture the difference between the root  $\sqrt{\text{PATER}}$  whose *e* undergoes deletion and the root  $\sqrt{\text{CITER}}$  whose *e* is stable; compare *pater-Ø* ‘floor, GenPl’ and *patr-a* ‘floor, GenSg’ vs. *citer-Ø* ‘cither, GenPl’ and *citer-a* ‘cither, NomSg’. This behaviour pleads in favour of the analysis proposed by CVCV: in the lexicon, vowels alternating with zero are unique phonological objects.

### 3.3. Syllabic consonants: segments linked to multiple constituents

Not only vowels alternating with zero, but also syllabic consonants are assumed to have a unique structure: they are only segments that are associated simultaneously with a non-nuclear and a nuclear constituent. Within the CVCV framework, several analyses of syllabic consonants have been proposed, e.g. Scheer (2004) or Blaho (2004), among others. As far as I know, they agree on that in a given language, all syllabic consonants have the same structure, it is either VC (Scheer 2004) or CV (Blaho 2004).

In Czech, the only consonants that can be syllabic are liquids [r] and [l]. Table (4) shows that liquids are syllabic only when two conditions are met: no vowel is adjacent to them and they are not in word-initial position.

#### (4) Contexts for syllabic and non-syllabic liquids

	C_C	C_#	#_C	(V)_ (V)
L	✓	✓		
L			✓	✓

Syllabic liquids are of two types depending on their position within the morpheme: morpheme-internal syllabic liquids are stable, but morpheme-final liquids have syllabic and non-syllabic alternants, depending on the structure of the following morpheme. In Ziková (in prep.), I argue that stable and alternating syllabic liquids differ structurally: the former are CV and the latter VC structures.

## (5) Alternating and stable syllabic liquids

	alternating L	stable L
CV		✓
VC	✓	

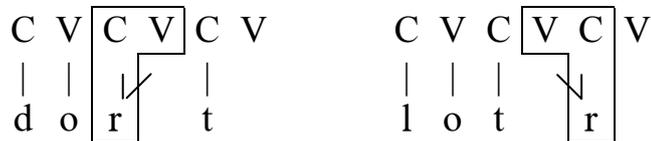
Of course, the question arises why in Czech only liquids, but not other consonants can be syllabic. It can scarcely be a coincidence that syllabic consonants are typically restricted to sonorants. Adopting the Element Theory view that segments have a hierarchical structure which consists of privative melodic primes (elements), I assume that this is the aperture element A what is responsible for branching. I propose that in Czech only liquids are A-headed consonants, hence only they can branch and only they can be syllabic.

Provided that branching follows from the subsegmental structure, liquids are expected to branch whenever they can, i.e. whenever the empty Nucleus is available. From this it follows that being linked simultaneously to C and V is a necessary, but not a sufficient condition for liquids to be syllabic: only those doubly linked liquids are syllabic which are not adjacent to any vowel.<sup>3</sup>

These assumptions are illustrated in (6). In (6a), I show the lexical representation of the root  $\sqrt{\text{DORT}}$  'cake'. The liquid is linked to the following empty Nucleus. It never realizes as syllabic because the full Nucleus precedes it. In (6b), in the root  $\sqrt{\text{LOTR}}$  'rouge', the liquid stands in morpheme-final position. The preceding Nucleus is empty, hence a target of spreading. The liquid is syllabic or non-syllabic depending on whether the root-final Nucleus is empty or not; compare *lotr-Ø* 'rouge, NomSg' and *lotr-a* 'rouge, GenSg'.

3 On the other hand, if word-initial liquids are never syllabic even though they adjoin no vowels, they can never be doubly linked; see e.g. *rtuť* 'mercury, NomSg', *lhát* 'lie, inf.', or *lhostejnost* 'indifference, NomSg'. It follows that not all empty Nuclei can be potential targets for spreading. Of course, one may ask why do root-initial liquids never branch. I claim that they do not branch for two reasons. A first one is a presence of domain. In Ziková (2007), I argue that in Czech root-initial clusters form domains and empty Nuclei enclosed within such domains cannot accommodate any melody. A second reason why root-initial liquids do not spread is a presence of lexically floating vowels which serve as barriers against spreading.

## (6) Lexical representation of liquids

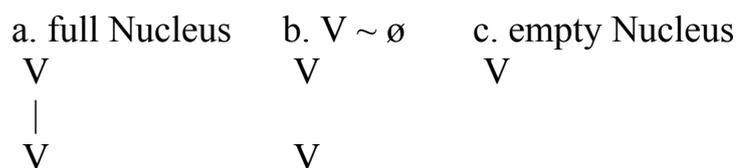
a.  $\sqrt{\text{DORT}}$ b.  $\sqrt{\text{LOTR}}$ **3.4. Summary**

I have shown how  $V \sim \emptyset$  alternations and syllabic consonants are encoded in the lexicon:  $V \sim \emptyset$  alternations are Nuclei with floating vowels, syllabic consonants are doubly linked segments. In the next section, the derivation of  $V \sim \emptyset$  alternants is discussed.

**4.  $V \sim \emptyset$  alternations are results of Government**

Up to now, we have identified three types of Nuclei: full Nuclei (7a), Nuclei with lexically floating vowels (7b), and empty Nuclei (7c). Whether Nuclei with lexically floating vowels end up as full Nuclei depends on whether they are governed or not.

## (7) Typology of nuclear constituents



In CVCV,  $V \sim \emptyset$  alternations are interpreted as results of Government: Government prevents lexically floating vowels from connecting with their Nuclei, hence produces zero alternants.

Government is a regressive relation that holds between the constituents: Nuclei govern either other Nuclei, or their own Onsets. What is important is that only those Nuclei which are not governed display Government. In case that there are two full Nuclei in a row, the second one always governs the closest constituent, i.e. its own Onset. From this it follows that full Nuclei are never governed, hence always govern: whenever a Nucleus with a lexically floating vowel is followed by a full Nucleus, it is governed. As for morpheme-final empty Nuclei and their effect on  $V \sim \emptyset$  alternations, they are governed (due to

the morphology), therefore do not govern. In that case, an association line between the floating segment and its Nucleus is created.

#### 4.1. Preliminary conclusion

Given the merger of positive markers produces zero alternants, it follows that no empty Nucleus intervenes between the stem and the positive marker.

### 5. Zero markers

Zero markers have no phonological structure of their own, i.e. no lexical representation on any phonological level. Their effect on the form of the stem arises from the empty Nucleus which stands at the end of the stem. This is illustrated in (8). In (8a), I show the derivation of the genitive plural form [pater]. We already know that the *e* before the stem-final liquid lexically floats (see (3) above). In the genitive plural form, the *e* associates with its constituent ( $V_2$ ) because it is not governed by the following empty Nucleus. (8b) shows the nominative singular form [lotr]. The morpheme-final liquid lexically branches onto the empty  $V_2$  (see the representation of the root in (6b)). The liquid is syllabic because the other adjacent Nucleus,  $V_1$ , is empty.

#### (8) Derivation of strong alternants

a. GenPl *pater-Ø*

C	V	C	$V_2$	C	$V_1$
			↑		
p	a	t	ε	r	

b. NomSg *lotr-Ø*

C	V	C	$V_2$	C	$V_1$
			\		
l	o	t		r	

This analysis explains why stem-final liquids must be left-branching, not right-branching as Blaho (2004) assumes. If the liquid branches on  $V_1$ ,  $V_1$  would be a good governor which could govern the empty  $V_2$ . The problem is that the same scenario would be expected also for the structure in (8a). If word-final liquids branch to their right, this is what the liquid in (8a) should do. As before, the stem-final Nucleus would be a good governor for the  $V_2$  which, this time, hosts a floating vowel. Since Government prevents floating vowels from surfacing, we get a wrong result with a syllabic liquid \**patr*. To sum up, the right-branching scenario for word-final liquids predicts that preceding  $V \sim \emptyset$  alternation sites remain unvocalised. However, the reverse is observed: alternation sites in the context  $C\_L\#$  are always vocalised (e.g. *kotel* ‘boiler, NomSg’ vs. *kotøl-e* ‘boiler, GenSg’ or *jisker* ‘spark, GenPl’ vs. *jiskør-a* ‘spark, NomSg’).

Also, the fact that alternation sites are vocalised before word-final liquids is a strong argument in favour of floating vowels. In the Standard Government Phonology, alternation sites are lexically empty Nuclei. If they remain un-governed they are filled in with appropriate vowels (see e.g. Kaye (1995) where  $e \sim \emptyset$  alternations in Polish are discussed). In that case, the roots  $\sqrt{\text{PATR}}$  and  $\sqrt{\text{BRATR}}$  have the same structure: the Nucleus which separates the final cluster, i.e.  $V_2$ , is empty. The question that arises is how the phonology knows that in case of  $\sqrt{\text{PATR}}$  the un-governed  $V_2$  has to be filled in, while it accommodates the spreading of the liquid in the derivation of the root  $\sqrt{\text{BRATR}}$ . Provided that the alternating vowels are encoded in the lexicon as floating segments, this problem does not arise: the floating vowel serves as a barrier against liquid spreading.

## 6. Vowel-initial markers

If the merger of positive markers always produces weak alternants, marker-initial vowels must belong to the stem-final Nucleus. How, then, should they be represented lexically?

In case of markers that begin with a short vowel, we have no choice but to let these vowels lexically float. That is, marker-initial short vowels are lexically floating segments that lack any syllabic support. In order to be pronounced, they need to associate to an empty Nucleus. On the other hand, marker-initial long vowels are lexically associated to a Nucleus and specified for spreading to their left. The lexical difference between long and short marker-initial vowels is illustrated in (9).

### (9) Affix-initial short vs. long vowels

a. LocPl marker *-ech* [ɛx]

C	V
ε	x

b. GenPl marker *-û* [u:]

C	V
	u

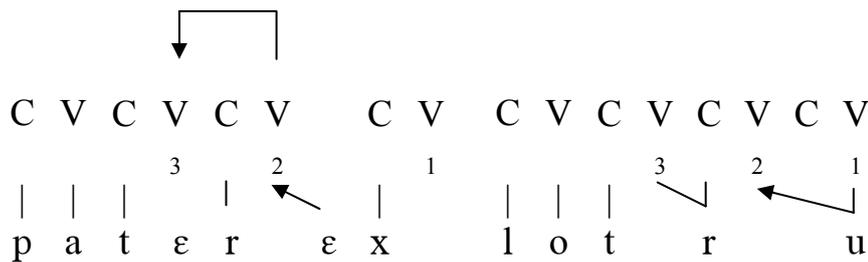
In (10), I show the effect of the merger of these case markers with our tested roots  $\sqrt{\text{PATR}}$  and  $\sqrt{\text{LOTR}}$ . (10a) shows the merger of the root  $\sqrt{\text{PATR}}$ , whose structure has been introduced in (3), with the LocPl marker *-ech*. The form [patrɛx] is produced. The affix-initial vowel associates with the root-final empty Nucleus  $V_2$ . It governs the preceding Nucleus  $V_3$  and thereby prevents the floating  $e$  from being spelled out (the empty Nucleus  $V_1$  is governed because it is word-final). (10b) illustrates the merger of the root  $\sqrt{\text{LOTR}}$ , whose lexical representation appears in (6b), with the GenPl marker *-û*. The form [lotru:] is

produced. Following its lexical specification, the affix-initial vowel spreads to the root-final Nucleus  $V_2$  and is therefore realized as a long vowel. The root-final liquid lexically branches to its left, but it is not syllabic now because the Nucleus to its right is filled with the affix vowel.

(10) Derivation of weak alternants

a. LocPl *patr-ech*

b. GenPl *lotr-ů*



6. On the notion of a phonological cycle/domain

Vowel-zero alternations are usually interpreted in terms of cyclic derivation; see e.g. Rubach (1984), Kaye (1995) or Marvin (2002), among others. In this section, I argue for a model where the non-cyclic behaviour of vowel-initial case markers follows from their phonological structure, rather than from a diacritic feature attached to the lexical representation of the morpheme (e.g. “being non-analytic” in Kaye 1995).

Kaye distinguishes two types of morphology according to whether the boundary between two morphemes is interpreted phonologically (analytic morphology), or not (non-analytic morphology). In the former case, the adjacent morphemes are said to belong to two separate phonological domains (their phonological structure is derived in two cycles), while in the latter, they sit in the same domain (their phonological structure is derived in one single cycle).

Among others, Kaye analyses the Polish examples *pies-Ø* ‘dog, NomSg’ and *ps-a* ‘dog, GenSg’ which are parallel to the Czech examples discussed in this paper. In the genitive form, the alternation site inside the root is not vocalised, hence must be governed. In Kaye's terms, this means that the case marker is non-analytic and hence the root and the genitive marker *-a* belong to the same domain. The *-a* thus is associated with the final Nucleus of the root which, being contentful, governs the preceding alternation site. However, Kaye does not explain how it has ended up in the root-final empty Nucleus. Furthermore, he claims that being invisible to the phonology, all non-analytic morphology must be recorded in the lexicon. If all positive case markers have the same effect on the alternating site, this inevitably leads to the conclusion that all

inflected nominal forms must be stored in the lexicon as such, a result which is highly implausible. Moreover, not only case markers, but also all other vowel-initial suffixes provoke weak alternants as illustrated in (11). Therefore *all* structures derived by vowel-initial suffixes have to be recorded in the lexicon.

- |      |  |  |
|------|--|--|
| (11) | <i>dvou-patøř-ák</i><br>two-√FLOOR-noun<br>'double-decker' | <i>patøř-ov-ý</i><br>√FLOOR-adj.-Agr<br>'related to floor' |
|------|--|--|

If all vowel-initial suffixes behave alike, their non-cyclic behaviour should be derived from their phonological structure rather than from a diacritic feature as proposes Kaye. Furthermore, provided that all vowel-initial suffixes are non-cyclic, phonological cyclicity cannot be syntactically driven as Marvin (2002) assumes. Otherwise, all vowel-initial suffixes should have analogical syntactic features which they apparently do not have (as shown also in (11)).<sup>4</sup>

## 7. Conclusion

In this paper, I have presented an analysis of Czech inflected nominal forms that is couched in the phonological framework known as CVCV. I have argued that non-cyclicity of positive case markers follows from the lexical representation of their initial vowels: they are lexically specified to occupy a final Nucleus of the preceding morpheme whenever it is empty.

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4 For more arguments that phonological cyclicity is independent of morphosyntactic structure see Scheer & Ziková (2007).

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Sašo Živanović

## Varieties of *most*: on different readings of superlative determiners

### 1. Introduction

This paper deals with definite determiners (DDs) and superlative determiners (SDs). It is shown that, using a suitable formal language, meanings of DDs and a certain class of SDs, which includes the English *most*, are structurally similar. More precisely, the structure of *most* is more complex than the structure of *the*. Based on this finding we get a cross-linguistic generalization that all languages having an SD like *most* also have a DD.

In section 2 the operative definition of SDs is given, and it is shown that in general SDs have two readings, which I call the majority and the plurality reading. Section 3 introduces the formal language  $L^*$  and provides the denotations for DDs and the two readings of SDs. Section 4 establishes the cross-linguistic prediction correlating the existence of DDs and majority SDs. In section 5, data from several languages is presented. Section 6 concludes the paper.

### 2. Superlative determiners and their meanings

In this paper, the term “determiner” is used in a wider sense than usually. It subsumes all lexical items that have the ability of influencing the reference of noun phrases, no matter what their morphological realization is or what their other uses might be.

Usually, a property taken to be characteristic of determiners is *conservativity*. (Informally, *five* in (1) is conservative since the truth of (1) depends only on properties of the boys.) As Herburger (2000) discusses, the standard notion of conservativity (Keenan and Stavi 1986) collapses two independent issues. The first one is the conservativity of the relation a determiner denotes, (2). The second one concerns certain syntax–semantics interface assumptions: which syntactic constituents’ denotations provide arguments to the relation the determiner denotes? The standard assumption is that »(w)hat counts as A in (the definition in (2)) are the noun phrases that (a determiner) attaches to in the overt syntax (its c-command domain), and what counts as B are the c-command domains of those noun phrases« (Herburger 2000: 90).

(1) *Five boys were dancing.*

(2) Relation R is *conservative* iff  $R(A, B) \Leftrightarrow R(A, A \cap B)$  for every pair of sets A, B.

Herburger argues that in the case of *only*, which is usually taken to be non-conservative, it is not the conservativity of the denotation that is problematic, but the interface assumptions: arguments A and B are partly determined by focal mapping. Thus, *only* is conservative in the sense that to determine the truth of (3) one only needs to consider fur-shedding cats with tails. (Capital letters indicate focus.) It is trivial to see that other (e.g. adverbial) uses of *only* are conservative in this sense, too.

- (3) [*Only cats with LONG tails*] *shed fur* (surface syntax)
- (4) *Only* [[*cats with LONG tails*] *shed fur*] (Q-raising)
- (5) *Only* [[*cats with tails*] *shed fur*] [[*cats with LONG tails*] *shed fur*] (focal mapping)

Thus, a broader definition of conservativity should be divorced from syntax–semantics interface assumptions. I argue in Živanović (2007) that under such definition everything is conservative, which renders conservativity unsuitable as a criterion for some class of elements, including determiners.

For purposes of this paper I define determiners as lexical items that can combine with NPs (it does not matter if subsequent operations destroy the surface adjacency or if there are other, e.g. adverbial uses of the same lexical item) and influence the way these NPs refer.

I also require determiners to have formal and not lexical (conceptual) meaning. While the formal–conceptual distinction between words *the* and *dog* is clear, this is much less so with *most* and *majority*. In categorizing such unclear cases, if it can be shown that a lexical item belongs to an open syntactic category I take its meaning to be conceptual. This is important since I do not wish to deal with nominal expressions for majority here. While properties of the human conceptual system are certainly an interesting topic of research, I believe this system is not a part of the core language faculty (cf. Chomsky 1995), and thus assume it should be studied separately.

In particular, the Slovenian word *večina* ‘majority’, although it is used to translate English sentences containing *most*, is a noun, not a determiner, therefore its existence is irrelevant for the discussion in this paper.

- (6) *Večina ljudi je jedla rezance s piščancem.*  
 majority people is eaten noodles with chicken  
 ‘Most people were eating noodles with chicken.’

Our working definition of SDs will therefore not be based only on meaning. Whenever possible, morphological similarity to adjective gradation will also be used as a criterion. The most reliable criterion for distinguishing modification of adjective by intensifiers like *very* and adjective gradation seems to be the possibility of explicating a comparison class in the latter constructions. Actually, this criterion is also useful for determining comparative and superlative determiners directly, in the absence of adjective gradation.

In Slovenian, I claim that *največ* ‘most’ is an SD.<sup>1</sup> It is a superlative since it contains *naj-*, a morpheme used in superlative adjectives, (7)–(8). It is a determiner since it can be combined with an NP, helping to determine its referents: (9) is not about all guinea pigs; if guinea pigs are partitioned into groups according to the sound of which kitchen appliance they recognize, (9) is about the largest of these groups, asserting that the guinea pigs in the largest group can recognize the sound of refrigerator.

(7) *smešen, bolj smešen, najbolj smešen*  
funny, funnier, the funniest

(8) *lepa, lepša, najlepša*  
beautiful, more beautiful, the most beautiful

(9) *Največ morskih prašičkov pozna zvok HLADILNIKA.*  
most see pigs know sound refrigerator  
‘A plurality of guinea pigs can recognize the sound of refrigerator.’<sup>2</sup>

The usage and the meaning of the English *most* and the Slovenian *največ* differ. First, Slovenian sentences containing *največ* are grammatical only if they contain a focused constituent as well, cf. (10)–(11).

1 Actually, syntactically *največ* resembles *samo* ‘only’.

2 It is difficult to give an English translation of such sentences—precisely because of the difference between *največ* and *most* discussed in this paper. I was choosing between three options. (i) The paraphrase “more guinea pigs can recognize the sound of refrigerator than of any other kitchen appliance” seems too cumbersome and must explicitly mention the alternatives. (ii) I have learned from a reviewer that *the most* can be used not only as an adverb, but also as a determiner, so the translation “the most guinea pigs can recognize the sound of refrigerator” should be a perfect solution. However, most English speakers I have consulted reject such use of *the most*. I thus stick to (iii) the word *plurality*, suggested to me by Peter Ludlow, although I’m aware that (i) it is a political term restricted to US English and (ii) it refers only to a “majority of less than 50%” (Crowther 1995). In this paper I expand its use to cover cases of a majority of more than 50% as well.

- (10) \* *Največ ljudi pije pivo.*  
 most people drink beer
- (11) *Največ ljudi pije PIVO.*  
 most people drink BEER  
 ‘A plurality of people are drinking beer.’
- (12) *Most people are drinking beer.*

Also, despite what one might think on the basis of the word-to-word parallel, the meanings of (11) and (12) actually differ. (12) has what we shall call the *majority* reading: it is true iff the number of people drinking beer is greater than the number of all other people (i.e. over 50% of all the people).

The meaning of a Slovenian sentence with *največ* depends on which constituent is focused. In (11), the focus is on *beer*, so people are partitioned into groups according to which beverage they drink (everyone drinks only one kind of beverage). The sentence is true iff the group of beer-drinkers is the largest of these groups, even if the number of beer-drinkers does not exceed the sum of the sizes of the other groups (i.e. does not exceed 50% of all the people who drink). We shall call this the *plurality* reading. (Note that unlike in the case of *most*, only people who drink are considered.)

Finally, German data shows that an SD can have both readings in a single language.<sup>3</sup>

- (13) *Die meisten Leute trinken Bier.* (German)  
 the most people drink beer.  
 ‘Most people are drinking beer.’
- (14) *Die meisten Leute trinken BIER.* (German)  
 the most people drink beer  
 ‘A plurality of people are drinking beer.’

### 3. Definite and superlative determiners in L\*

It is well known (Barwise and Cooper 1981) that the meaning of the English *most* cannot be expressed in first-order predicate logic (PLO). In natural language semantics, this fact had lead to a widespread adoption of the Generalized Quantifier (GQ) theory. In this paper, I do not follow the standard practice and use L\*, a formal language originally developed by Law and Ludlow (1985)

3 For some speakers, English *most* can also have the plurality reading, at least in some syntactic environments (cf. de Hoop 2006).

and further discussed in Ludlow (1995, 2002). Superficially, the version of L\* used in this paper does not resemble the original version very much: similarities lie in the formal definition (Živanović 2007: §3.1.1). In this paper, L\* will be presented only informally.

Superficially, L\* resembles PLO, but in L\* the objectual (i.e. non-numerical) variables<sup>4</sup> stand for groups of individuals. However, L\* does not equal ordinary plural logic, which allows for non-distributive predicates generally. In L\*, these are exceptional. All lexical predicates in L\* are distributive;<sup>5</sup> only two non-distributive predicates are defined.

(15)  $\text{quant}(n, x)$  is true iff  $x$  stands for (exactly)  $n$  individuals.

(16)  $x = y$  is true iff  $x$  and  $y$  overlap.<sup>6</sup>

Thus, the meaning of (17) is represented as (18). Note that although  $\text{quant}$  is defined in the *exactly* sense, (18) still encodes the *at least* reading.

(17) *Five boys were dancing.*

(18)  $\exists x[\text{boy}(x) \wedge (\exists n[5(n)]\text{quant}(n,x))]\text{dance}(x)$

Whereas the semantics of the existential quantifier is intuitive ( $\exists x[A(x)]B(x)$  means that there is a group  $x$  of  $A$ s such that all members of  $x$  are  $B$ s), the meaning of the universal quantifier might seem counterintuitive at first sight.  $\forall x[A(x)]B(x)$  does not mean that for any group  $x$  of  $A$ s all members of  $x$  are  $B$ s, but that for any group of  $A$ s at least one member of  $x$  is  $B$ . This follows by the standard definition of the universal quantifier,  $\forall x : \varphi \stackrel{\text{def}}{=} \neg \exists x : \neg \varphi$ . This makes the representation of the meaning of sentences like (19) very transparent.

(19) *Every ten pages he scribbled something on the edge.*

(20)  $\forall x[\text{page}(x) \wedge (\exists n[10(n)]\text{quant}(n,x))]\text{scribbled-on}(x)$

I adopt the Russellian analysis of DDs, which translates to L\* as (22).<sup>7</sup> (22) is read as follows: there is a group  $x$  such that (i) every member of  $x$  is an S

4 There are no individual constants or functions in L\*.

5 Collective vs. distributive readings are encoded by varying the scope of individual and event quantifiers.

6 Symbol '=' is used since (i) the identity predicate is not needed and (ii) identity and overlap are extensionally the same in the case of singular variables.

7 S stands for subject, V for verb, and O for object.

and (ii) for every group  $y$  of  $Ss$ , groups  $y$  and  $x$  overlap; every member of  $x$  is a  $V$ . The point of the formula: if  $x$  is not taken to be the group of all  $Ss$ , then  $y$  can be chosen as some of the remaining  $Ss$ , and will thus not overlap with  $x$ .

(21) *The S Vs. / The Ss V.*

(22)  $\exists x[S(x) \wedge (\forall y[S(y)]y = x)]V(x)$

Note that (22) is indeterminate with respect to the grammatical number of the NP, so in a real sentence, the restriction of  $\exists x$  includes the interpretation of number which differentiates between singular and plural definite phrases. For definite phrases containing a numeral, (22) also includes predicate quant as in (18).

(24), the analysis of the English SD *most*—impossible in PLO—is very Russellian. The formula reads as follows: there is a group  $x$  such that all members of  $x$  are  $Ss$  and that there is a natural number  $n$  such that the cardinality of  $x$  is  $n$  and every group  $y$  of  $Ss$  with cardinality  $n$  overlaps with  $x$ ;  $x$ s are  $Vs$ .

(23) *Most Ss V.*

(24)  $\exists x[S(x) \wedge \exists n : \text{quant}(n,x) \wedge (\forall y[\text{quant}(n,y) \wedge S(y)]y = x)]V(x)$

Why does (24) work? (i) Suppose more than half  $Ss$  are  $Vs$ . Set  $x$  to be the group of all  $Ss$  that are  $Vs$ , and  $n$  to be the number of members in  $x$ . Since more than half  $Ss$  are  $Vs$ , the number of  $Ss$  not in  $x$  is less than  $n$ . It follows that any group of  $Ss$  having  $n$  members will overlap with  $x$ . (ii) Suppose less than or equal to half  $Ss$  are  $Vs$ . We want to show that (24) is false, which is equivalent to showing that (25) is true—for ease of explanation  $(\forall y[\dots]y = x)$  has also been replaced with the equivalent  $\neg(\exists y : \dots \wedge y \neq x)$ . Let us choose any group  $x$  of  $Ss$  such that it is impossible to choose a group  $y$  disjoint with  $x$  containing the same number of members as  $x$ : this of course means that  $x$  contains more than half  $Ss$ , so by hypothesis at least one member of  $x$  cannot be  $V$  (remember the meaning of the universal quantifier, (18)–(19)).

(25)  $\forall x[S(x) \wedge \exists n : \text{quant}(n,x) \wedge \neg(\exists y[\text{quant}(n,y) \wedge S(y)]y \neq x)] \neg V(x)$

(22) and (24) are obviously similar: both conform to (26), which I will call the *definiteness pattern*. Furthermore, formula for *the* seems to be a “pure” instantiation of the pattern, whereas formula for *most* is more complex, since it

contains additional material: two atomic formulae based on quant, containing the same numerical variable n, and an existential quantifier binding n.<sup>8</sup>

$$(26) \quad \dots \exists x [\dots S(x) \wedge (\forall y [\dots S(y) \dots] y = x) \dots] \dots$$

In Slovenian, the SD *največ* cannot be used in a sentence whose truth conditions are describable with a formula conforming to the definiteness pattern. As mentioned above, *največ* can only be used in a sentence with focus, yielding truth conditions in (28).

$$(27) \quad \text{Največ Sjev Vja } \underline{O}.$$

‘A plurality of Ss V an O.’

$$(28) \quad \exists n : \exists x : S(x) \wedge \text{quant}(n, x) \wedge \exists y : O(y) \wedge V(x, y) \wedge \\ \neg (\exists P : \text{Alternative}(O, P) \wedge \exists x' : S(x') \wedge \text{quant}(n, x') \wedge \exists y' : P(y') \wedge V(x', y'))$$

Let us illustrate how (28) works on (11) (S=people, V=drink, O=beer). (28) asserts that (i) there is a number n such that there is a group of people (x) with n members, all of them drinking beer, and that (ii) it is not the case that there exists an alternative drink (P: wine, vodka, ...) such that a group of people (x') with n members would exist, all of them drinking P. This of course means that if people (who are drinking something) are partitioned with respect to what they are drinking, the group of people drinking beer is the largest of these groups.

(24)/(25) for *most* and (28) for *največ* are similar in some ways. First, they both contain a non-negated and a negated part. Second, in both formulae the numerical argument of both occurrences of quant is the same—a numerical variable bound by an existential quantifier. There are, however, also important differences between *most* and *največ*. First, (28) uses second-order quantification and a second-order predicate Alternative.<sup>9</sup> Furthermore, whereas in (24) (and (22)) only the predicate corresponding to the NP appears twice in the formula (once in the non-negated and once in the negated part), in (28) this is true

8 Even if (22) is replaced by the equivalent, but more complex (i), the observation that the formula (25) for *most* is more complex than the formula for *the* remains valid, since it must be assured that in (24) the numerical variables of both occurrences of quant are the same.

(i)  $\exists x [S(x) \wedge (\exists n : \text{quant}(n, x)) \wedge (\forall y [S(y) \wedge (\exists n : \text{quant}(n, x))] y = x)] V(x)$

9 Alternative(O,P) is true iff predicate P is an alternative to O, in the sense of Rooth (1996). See Živanović (2007) for an analysis of focus constructions without this predicate (but still using second-order quantification).

for all predicates (although the predicate corresponding to the focused constituent is special).

I must emphasize that the differences between (24)/(25) and (28) do not imply that there is no common core to the meaning of both types of SDs—the formulae differ mainly due to fact that focus contributes to derivation of (28). Establishing the common core is outside the scope of this paper; see Živanović (2007) for discussion. Let me just mention that the difference between *most* and *največ* seems to be that of a strong versus a weak determiner; see also de Hoop (2006). The Slovenian *največ* obligatorily associates with focus (undergoes Q-raising in Herburger's (2000) terminology), the English *most* cannot do that; for German *die meisten*, association with focus is optional.

L\* representations of the meanings of DDs and SDs being given, I can lay out my reasons for not doing the analysis using GQ. It is not that it is impossible to conceive of GQ denotations where the parallel between DDs and absolute SDs is transparent. This can be done, for example, by mimicking L\* representations using GQ, as in (29)–(30). Rather, the point is that, as far as I know, in GQ the attention is focused on the semantic properties of the denotations and not on their syntactic form. On the other hand, Ludlow (2002) makes it explicit that L\* is envisioned as being integrated into linguistic theory as a readout of LF. In GQ, syntax provides arguments to the functions lexical items denote; in the theory using L\*, LF is assumed to encode L\* formulae, thus making the syntax–semantics interface more transparent.<sup>10</sup>

(29)  $\text{the}_E(V, S)$  iff (i) there exists a  $X \subset S$  such that for all  $Y \subset S$ ,  $|X \cap Y| \neq 0$  is true, and (ii)  $X \subset V$ .

(30)  $\text{most}_F(V, S)$  iff (i) there exists a  $X \subset S$  such that for all  $Y \subset S$  where  $|X| = |Y|$ ,  $|X \cap Y| \neq 0$  is true, and (ii)  $X \subset V$ .

#### 4. Cross-linguistic prediction

English has both a majority SD and a DD, Slovenian has neither of these. Is this merely a coincidence? The previous section tells us that majority SDs (like *most*) are more complex than DDs (like *the*). It is thus reasonable to suppose that languages having majority SDs are a subset of the languages having DDs.

In more detail, the argument is following. In Živanović (2007) I argue that definiteness is realized through a DefP in the extended NP projection, whereas the majority reading of SDs is a result of interaction between this DefP and a (higher located) N(ume)ralP, also a part of the extended NP projection. Thus,

<sup>10</sup> In Ludlow (1995, 2002) this is exploited to give a syntactic characterization of environments licensing directional entailment and NPIs.

the part of the featural composition of *the* responsible for its definiteness is simply the feature (Def); a majority SD like *most*, on the other hand, must contain not only (Def) but also (Nral). Featurally, majority SDs are a superset of DDs. It seems reasonable to conjecture that a language realizing some complex structure will also realize the less complex structure, hence the prediction that only languages having DDs will have majority SDs.

The previous section also shows that the meaning of plurality SDs is independent from the meaning of majority SDs and DDs. In Živanović (2007) I claim that in Slovenian no lexical item contains a (Def) feature checked in the extended NP projection. Instead, it is suggested that the semantics of DefP and FocusP are essentially equal and that the plurality reading is a result of the interaction between NralP in the extended NP projection and FocusP of the extended VP projection. Thus plurality SDs are not part of the complexity scale correlating DDs and majority SDs.

Typologically, we predict that of the four logically possible types of languages only three can be found, as shown in the table below. As the data in the following section shows, the prediction seems to be borne out.

(31) DD majority SD prediction

yes	yes	ok
yes	no	ok
no	yes	*
no	no	ok

The prediction cannot be falsified by a language having a DD, since, as table (31) shows, we make no prediction with respect to the existence of a majority SD in such a language. Furthermore, if a language has no SDs, or even no superlatives (and comparatives) at all (i.e. if there is no adjective gradation in the language), there is probably some other reason for such a situation and the prediction is again trivially confirmed. On the other hand, a language with no DDs but having SDs is a real test for the hypothesis, since it is predicted that its SDs will not have the majority reading. Slavic languages are an ideal testbed for this hypothesis, since almost all of them lack DDs but have SDs.

Additionally, the analysis makes a prediction about the diachronic development: a language cannot develop a majority SD without (first) developing a DD. Again, Slavic languages are perfect for testing the prediction. The only Slavic languages having DDs are Macedonian and Bulgarian, which are thus the only ones able to develop a majority SD. As the data in the following section

shows, this actually happened in Macedonian:<sup>11</sup> besides the plurality SD *najmnogu* there is a majority SD *poveќе* (which can also function as a comparative determiner.)

## 5. The data

All data about SDs comes from fieldwork.<sup>12</sup> Some additional information, mainly on DDs and adjective gradation, was taken from papers and descriptive grammars listed in the references.

### 5.1. Languages without a definite determiner

If there is a counterexample to the prediction it must come from the class of languages without a DD. Among the languages I have checked, the following have no DD: Czech, Hindi, Japanese, Kannada, Mandarin Chinese, Polish, Punjabi, Serbian, Slovenian, Tamil and Turkish. Out of these, Japanese, Kannada, Mandarin Chinese and Tamil have no SDs. Czech, Polish, Serbian, Slovenian and Turkish have an SD, but only with the plurality reading. The only counterexample I've come across is Hindi, which does not have a DD but seems to have a majority SD, but this might be due to the fact that my informant was trilingual (English–Hindi–Kannada)—he is also one of the English speakers who use *the most* as a plurality SD. Unfortunately, I haven't been able to check the Hindi situation with some other speaker yet.

For the above languages that have an SD, here is a list of example sentences using it. (The superlative is underlined.)

- (32) *Nejvíč lidí pije pivo.* (Czech)  
 most people drink beer  
 'A plurality of people are drinking beer.'

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11 As far as I know, Bulgarian behaves the same as Macedonian, but I have no data to present in this paper.

12 I am indebted to many friends and colleagues who have suffered providing the data: Ágnes Mélypataky, Alies MacLean, Asli Untak Tarhan, Bàrbara Soriano, Donald Reindl, Eva Reinisch, Friedrich Neubarth, Irena Temkova, Jon Anders, Kamila Xenie Vetišková, Laura Comí, Marie Olsen, Min Que, Naoyuki Yamato, Nataša Miličević, Peter Ludlow, Regula Sutter, Sameer Murthy, Sorin Greguț, Sylvia Blaho, Tanja Schwarzingler, T.S. Raju Chidambaram, Vrinda Chidambaram, and Yael Sharvit. I apologize to any I have accidentally left out. All the mistakes contained in the data are my own.

- (33) *log zyādātar bir pirhete* (Hindi)  
 people most beer were-drinking  
 ‘A plurality of people were drinking beer.’
- (34) *zyādātar log bir pirhete* (Hindi)  
 most people beer were-drinking  
 ‘Most people were drinking beer.’
- (35) *Najwięcej ludzi pilo piwo.* (Polish)  
 most people were-drinking beer  
 ‘A plurality of people were drinking beer.’
- (36) *Vaalaa aadmii nüü ziaadaa kette milii.* (Punjabi)  
 this man DAT more votes got  
 ‘This man got the plurality of votes.’
- (37) *Najviše ljudi pije pivo.* (Serbian)  
 most people drink beer  
 ‘A plurality of people are drinking beer.’
- (38) *Največ ljudi pije pivo.* (Slovenian)  
 most people drink beer  
 ‘A plurality of people are drinking beer.’
- (39) *İnsanlar en çok bira içiyor.* (Turkish)  
 men most beer are-drinking  
 ‘A plurality of people are drinking beer.’

(In Punjabi, when an explicit comparison class is given, *ziaadaa* functions as a comparative determiner.)

The following data from adjective gradation show that the underlined words above truly contain a superlative morpheme. (There is no special morphological form for superlative adjectives in Punjabi.<sup>13</sup>)

- (40) *chytrý, chytřejší, nejchytřejší* (Czech)  
 smart, smarter, the smartest
- (41) *prosty, prostszy, najprostszy* (Polish)  
 simple, simpler, the simplest

13 The same is true for Kannada. In Tamil, the situation is less clear: there seems to be no comparative degree of adjectives, but superlative degree can be formed by ‘mika+Adj’.

- (42) *interesujący, bardziej interesujący, najbardziej interesujący* (Polish)  
interesting, more interesting, the most interesting
- (43) *loš, lošiji, najlošiji* (Serbian)  
bad, worse, the worst
- (44) *güzel, daha güzel, en güzel* (Turkish)  
beautiful, more beautiful, the most beautiful

In most of these languages majority is expressed with a noun translating as ‘majority’: *většina* (Czech), *bahumad* (Hindi), *hotondo* (Japanese), *da-duo-shu* (Mandarin Chinese), *większość* (Polish), *većina* (Serbian), *perumpaamaj* (Tamil), *çok* (Turkish).<sup>14</sup> It can be seen from the data on adjective gradation above that these words are morphologically unrelated to the superlative morpheme used in adjective gradation. The following data shows the same for Japanese and Chinese (which have no SDs).

- (45) *utsukushii, motto utsukushii, ichiban utsukushii* (Japanese)  
beautiful, more beautiful, the most beautiful
- (46) *Na-ge zui piaoliang de nühai zheng wan dou zai tiaowu.* (Chinese)  
that most beautiful PTCL girl all night all is dancing  
‘The most beautiful girl danced all night long.’

## 5.2. Languages with a definite determiner

Languages having a DD cannot falsify the prediction, since the prediction does not assert that languages with DDs must have majority SDs but only that only languages with DDs can have majority SDs. It is nevertheless the fact that all such languages I have checked either (i) have a majority SD (English, Hungarian, Macedonian, German (Standard, Austrian, Swiss), Dutch, Norwegian (Bokmål), Romanian) or lack SDs entirely (Hebrew, Catalan).

Note that although in some languages the SD must be used together with the DD (Hungarian, German, Dutch, Norwegian), this is not always the case: in Macedonian, this is optional and in English ungrammatical. In Romanian, a form of the definite article (*cei*) is actually a part of the SD.<sup>15</sup>

14 Unfortunately, I do not have this information for Kannada and Punjabi.

15 This is also the case for the English plurality SD *the most* that some speakers have. Comparison of Macedonian, Romanian and English shows that the DD being morphologically a part of the SD tells us nothing about whether the SD has majority or plurality reading, or both.

The following examples show sentences containing a majority SD. Note that in Macedonian *poveké* is both a comparative and a superlative determiner. The latter reading shows up if *poveké* is used without an explicit comparison class. It is also interesting to note that *poveké* has both an indefinite and a definite form, the latter being used in partitive structures.

- (47) *Most people are drinking beer.* (English)
- (48) *A legtöbb diák tévét néz.* (Hungarian)  
 the most student TV watch-INDEF  
 ‘Most students are watching TV.’
- (49) *Poveké luđe pijat pivo.* (Macedonian)  
 more people drink beer  
 ‘Most people are drinking beer.’
- (50) *Poveketo od luđeto pijat pivo.* (Macedonian)  
 more-the from people-the drink beer  
 ‘Most of the people are drinking beer.’
- (51) *Die meisten Leute trinken Bier.* (German)  
 the most people drink beer  
 ‘Most people are drinking beer.’
- (52) *De meeste mensen drinken bier.* (Dutch)  
 the most people drink beer  
 ‘Most people are drinking beer.’
- (53) *De fleste studenter drikker.* (Norwegian)  
 the most students drink  
 ‘Most people are drinking.’
- (54) *Cei mai multi oameni beau bere.* (Romanian)  
 most people drink beer  
 ‘Most people are drinking beer.’

In most of these languages the majority SD also has the plurality reading. Macedonian shows that majority and plurality SDs can be morphologically unrelated: the majority SD is *poveké* and the plurality SD is *najmnogu*. (A small detail: *najmnogu* does not have the definite form; even when used with a definite NP (in a partitive construction), it is not marked for definiteness.)

- (55) *A legtöbb diák a tévét nezi.* (Hungarian)  
 the most student the TV watch-DEF  
 ‘A plurality of students (usually) watch TV.’
- (56) *Maglata predizvikuva najmnogu soobrakajni nesreki.* (Macedonian)  
 fog-the causes most traffic accidents  
 ‘A plurality of traffic accidents is caused by fog.’
- (57) *Najmnogu od lugeto vo Slovenija se belci.* (Macedonian)  
 most from people-the in Slovenia are white-people  
 ‘A plurality of people in Slovenia are white.’
- (58) *Die meisten Leute trinken Bier.* (German)  
 the most people drink beer  
 ‘A plurality of people are drinking beer.’
- (59) *De meeste mensen dranken bier.* (Dutch)  
 the most people drink beer  
 ‘A plurality of people are drinking beer.’
- (60) *De fleste drikker øl.* (Norwegian)  
 the most drink beer.  
 ‘A plurality of them are drinking beer.’
- (61) *Cei mai multi oameni beau bere.* (Romanian)  
 most people drink beer  
 ‘A plurality of people are drinking beer.’

The only languages with majority SDs not having plurality SDs are Swiss German and English, and even for English there is, for some speakers, an SD having the plurality reading: *the most*.

- (62) *The most people are drinking beer.* (for some speakers of English)

Also note that in Swiss German, the usage of the (majority) SD *meischt* is quite restricted. It is felt to be formal, and seems to be appropriate only when the speaker is included in the majority that is being spoken about.

- (63) *Di meischte vo üs trinket pier.*  
 the most from us drink beer  
 ‘Most of us are drinking beer.’

The following data from adjective gradation show that the underlined words above truly contain a superlative morpheme.

- (64) *leuk, leuker, leukst* (Dutch)  
nice, nicer, the nicest
- (65) *nagy, nagyobb, legnagyobb* (Hungarian)  
big, bigger, the biggest
- (66) *schön, schöner, der schönste* (German)  
beautiful, more beautiful, the most beautiful
- (67) *nov, ponov, najnov* (Macedonian)  
new, newer, the newest
- (68) *komplisert, mer komplisert, mest komplisert* (Norwegian)  
complicated, more complicated, the most complicated
- (69) *frumos, mai frumos, cel mai frumos* (Romanian)  
beautiful, more beautiful, the most beautiful

The existence of a majority SD does not preclude the existence of a noun translating as ‘majority’ (the above data shows that it is morphologically unrelated to the superlative morpheme): *töbség* (Hungarian), *mnozinstvo* (Macedonian), *Mehrheit* (German), *meerderheid* (Dutch), *majoritet* (Norwegian), *majoritatea* (Romanian). Such a noun is also used to express majority in languages having no SDs: *majoria* (Catalan) and *rov* (Hebrew).

- (70) *La majoria de la gent beu cervesa.* (Catalan)  
the majority from the people drink beer  
‘Most people drink beer.’
- (71) *Rov ha-anašim šotim bira.* (Hebrew)  
majority the-men drink beer  
‘Most people drink beer.’

Hebrew and Catalan, although having no SDs, nevertheless have adjective gradation. The following examples show that the superlative morpheme is morphologically unrelated to the word translating as ‘majority’.

- (72) *bonic, més bonic, el més bonic* (Catalan)  
 beautiful, more beautiful, the most beautiful
- (73) *ha- baxura haxi ce?ira* (Hebrew)  
 the girl most young  
 ‘the youngest girl’

### 5.3. Summary

It is clear from the summary of the data below that the prediction is borne out: all languages without a definite determiner (DD) lack a majority superlative determiner (mSD).<sup>16</sup>

(74) language	DD	mSD	pSD
Catalan	yes	no	no
Czech	no	no	yes
Dutch	yes	yes	yes
English	yes	yes	no/yes
German	yes	yes	yes
Hebrew	yes	no	no
Hindi	no	yes?	yes
Hungarian	yes	yes	yes
Japanese	no	no	no
Kannada	no	no	no
Macedonian	yes	yes	yes
Norwegian	yes	yes	yes
Chinese	no	no	no
Polish	no	no	yes
Punjabi	no	no	yes
Romanian	yes	yes	yes
Serbian	no	no	yes
Slovenian	no	no	yes
Swiss German	yes	yes?	no
Tamil	no	no	no
Turkish	no	no	yes

16 In Živanović (2007) I also argue that languages having a DD and a pSD also have a mSD.

## 6. Conclusion

In this paper I showed that cross-linguistically, superlative determiners have two readings: the absolute reading (more than half) and the plurality reading (the largest group, where the type of partitioning is determined by focus). Based on a semantic analysis, a prediction was made to the effect that if a language has a superlative determiner with the absolute reading, it also has a definite determiner. As the data in section 5 shows, the prediction seems to be borne out.

More work remains to be done. The selection of languages should be widened, focusing especially on potential counterexamples, i.e. languages without definite determiners but having superlatives in general. Adverbial uses of superlatives should be investigated. The generalization that maybe any language having superlative determiners has a superlative determiner with the plurality reading, hinted at in section 5, should be paid closer attention to. (English seems a peculiar exception here.) Furthermore, the prediction might be transferable to the adjectival domain, correlating the existence of the superlative adjective degree to the existence of the “adjectival” definite article, like *ta* (as in *ta lepa* ‘the beautiful one’) in colloquial Slovenian (Marušič and Žaucer 2005) and similar items in other Slavic languages.

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